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United States
Department of
Agriculture

Washington Water Supply Outlook Report

April 1, 2003



Water Supply Outlook Reports and Federal - State - Private Cooperative Snow Surveys

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How forecasts are made

Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual snow courses and automated SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño / Southern Oscillation are used in computerized statistical and simulation models to prepare runoff forecasts. These forecasts are coordinated between hydrologists in the Natural Resources Conservation Service and the National Weather Service. Unless otherwise specified, all forecasts are for flows that would occur naturally without any upstream influences.

Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

The wider the spread among these values, the more uncertain the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. (Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount.) By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

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Washington Water Supply Outlook

April 2003

General Outlook

Last month's question of "what effect the first of month storms would have" has been answered. Basin increases in snowpack and precipitation also increased April - September streamflow forecasts by as much as 21 percentage points. Though water-year precipitation levels are near normal in most basins, snowpack remains below normal. Analysis indicate the strong probability that basin snowpack may melt and runoff up to 30 days earlier than normal. National Weather Service is predicting the possibility of continued above average temperatures, which would contribute to faster melt rates. The spring precipitation trend looks to be equal chances of above, below, or near normal.

Snowpack

The April 1 statewide SNOTEL readings increased by 11% from the March 1 readings but still remain below average at 74%. The Elwah Basin snow surveys reported the lowest readings at 45% of average. Snow surveys in the Sanpoil River Basin reported the highest at 113% of average. Westside averages from SNOTEL, and April 1 snow surveys, included the North Puget Sound river basins with 69% of average, the Central Puget river basins with 56%, and the Lewis-Cowlitz basins with 71% of average. Snowpack along the east slopes of the Cascade Mountains included the Yakima area with 79% and the Wenatchee area with 85%. Snowpack in the Spokane River Basin was at 59% and the Walla Walla River Basin had 73% of average. Maximum measured snow cover in Washington was at Lyman Lake SNOTEL in the Chelan River Basin, with water content of 55.6 inches. This site would normally have 65.4 inches of water content on April 1. Last year at this time Lyman Lake had 73.3 inches of snow water. The highest average in the state was Moses Peak snow course with 184% of average.

BASIN	PERCENT OF LAST YEAR	PERCENT OF AVERAGE
Spokane	41	59
Newman Lake	33	53
Pend Oreille	89	93
Okanogan	69	73
Methow	67	69
Similkameen	61	66
Wenatchee	69	75
Chelan	66	79
Upper Yakima	60	73
Lower Yakima	76	85
Ahtanum Creek	74	85
Walla Walla	58	73
Lower Snake	75	84
Cowlitz	71	78
Lewis	40	64
White	81	90
Green	41	64
Cedar	32	54
Snoqualmie	39	61
Skykomish	44	62
Skagit	57	73
Baker	51	69
Nooksack	49	64
Olympic Peninsula	52	68

Precipitation

During the month of March, the National Weather Service and Natural Resources Conservation Service climate stations reported much above average precipitation totals throughout Washington river basins. The highest percent of average in the state was at Plain, WA, near Lake Wenatchee, which reported 271% of average for a total of 5.99 inches. The average for this site is 2.21 inches for March. The wettest spot in the state was reported at June Lake SNOTEL with a March accumulation of 28.7 inches, nearly 10 inches above the 30-year average for the site. Averages for the water-year increased considerably in most basins. The Lower Snake River Basin reported the highest water-year average at 100%, up 12-percentage point's form last month. The Upper Yakima and Spokane river basins tied for the lowest at 83% of average with respectable increases over last month.

RIVER BASIN	MARCH PERCENT OF AVERAGE	WATER YEAR PERCENT OF AVERAGE
Spokane	173	90
Colville-Pend Oreille	166	97
Okanogan-Methow	119	93
Wenatchee-Chelan	189	89
Upper Yakima	184	83
Lower Yakima	163	94
Walla Walla	174	99
Lower Snake	174	100
Cowlitz-Lewis	165	91
White-Green-Puyallup	163	84
Central Puget Sound	180	85
North Puget Sound	187	86
Olympic Peninsula	154	91

Reservoir

Seasonal reservoir levels in Washington vary greatly due to specific watershed management practices required in preparation for irrigation season, fisheries management, power generation and flood control. Reservoir storage in the Yakima Basin was 521,500-acre feet, 94% of average for the Upper Reaches and 198,000-acre feet, 131% of average for Rimrock and Bumping Lakes. Storage at the Okanogan reservoirs was 41% of average for April 1. The power generation reservoirs included the following: Coeur d'Alene Lake, 211,500 acre feet, 125% of average and 89% of capacity; Chelan Lake, 284,200 acre feet, 131% of average and 42% of capacity; and the Skagit River reservoirs at 135% of average and 71% of capacity. Considerable increases can be attributed to above average precipitation during the past month.

BASIN	PERCENT OF CAPACITY	CURRENT STORAGE AS PERCENT OF AVERAGE
Spokane	89	125
Colville-Pend Oreille	84	184
Okanogan-Methow	31	41
Wenatchee-Chelan	42	131
Upper Yakima	63	94
Lower Yakima	85	131
North Puget Sound	71	135

Streamflow

April forecasts vary from 93% of average for Clearwater River at Spalding to 55% of average for Mill Creek at Walla Walla. April-September forecasts for some Western Washington streams include the Cedar River near Cedar Falls, 89%; Green River, 86%; and Skagit River, 84%. Some Eastern Washington streams include the Yakima River near Parker, 81%; Wenatchee River at Plain, 79%; and Spokane River near Post Falls, 73%. Volumetric forecasts are developed using current, historic and average snowpack, precipitation and streamflow data collected and coordinated by organizations cooperating with NRCS.

Statewide March streamflows varied from much below to much above average. Mostly due to reservoir management in anticipation of spring runoff and above average precipitation. The South Fork Walla Walla River near Milton-Freewater had the highest reported flows with 271% of average. The Okanogan River at Tonasket with 41% of average, was the lowest in the state. Other streamflows were the following percentage of average: the Cowlitz, 147%; the Spokane at Spokane, 107%; the Columbia below Rock Island Dam, 109%; and the Cle Elum near Roslyn, 137%.

BASIN	PERCENT OF AVERAGE MOST PROBABLE FORECAST (50 PERCENT CHANCE OF EXCEEDENCE)
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Spokane	73-76
Colville-Pend Oreille	69-85
Okanogan-Methow	66-83
Wenatchee-Chelan	75-81
Upper Yakima	66-80
Lower Yakima	80-86
Walla Walla	55-74
Lower Snake	67-93
Cowlitz-Lewis	69-85
White-Green-Puyallup	86-89
Central Puget Sound	86-89
North Puget Sound	83-87
Olympic Peninsula	84-85

STREAM	PERCENT OF AVERAGE MARCH STREAMFLOWS
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Pend Oreille Below Box Canyon	124
Kettle at Laurier	91
Columbia at Birchbank	106
Spokane at Long Lake	101
Similkameen at Nighthawk	64
Okanogan at Tonasket	41
Methow at Pateros	56
Chelan at Chelan	113
Wenatchee at Pashastin	110
Yakima at Cle Elum	137
Yakima at Parker	121
Naches at Naches	113
Grande Ronde at Troy	124
Snake below Lower Granite Dam	88
SF Walla Walla near Milton Freewater	271
Columbia River at The Dalles	95
Lewis at Ariel	157
Cowlitz below Mayfield Dam	147
Skagit at Concrete	140

For more information contact your local Natural Resources Conservation Service office.

BASIN SUMMARY OF SNOW COURSE DATA

APRIL 2003

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1971-00	SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1971-00
ABERDEEN LAKE CAN.	4000	3/27/03	14	3.9	4.8	5.6	GRAYSTOKE LAKE CAN.	5500	3/26/03	43	11.2	--	16.0
ABOVE ROLAND	4350	4/01/03	57	21.2	--	30.4	GREEN LAKE	6000	4/01/03	---	32.0E	--	35.0
ABTANUM R.S.	3100	3/27/03	0	.0	3.7	5.3	GREEN LAKE SNOTEL	6000	4/01/03	62	21.3	26.3	23.0
ALPINE MEADOWS	3500	4/01/03	---	22.0E	66.5	42.3	GREYBACK RES CAN.	4700	3/27/03	30	9.7	7.6	9.2
ALPINE MEADOWS SNTL	3500	4/01/03	---	23.0	81.0	43.6	GRIFFIN CR DIVIDE	5150	3/27/03	26	6.3	10.6	10.3
AMBROSE	6480	3/24/03	49	16.1	10.5	12.4	GROUSE CAMP SNOTEL	5380	4/01/03	---	21.0	22.6	19.8
ASHLEY DIVIDE	4820	4/01/03	8	2.4	8.0	6.0	GUNSIGHT LAKE	6300	3/30/03	91	32.8	45.9	39.3
BADGER PASS	6900	3/30/03	88	31.2	43.4	--	HAMILTON HILL CAN.	4550	3/27/03	32	9.6	15.7	14.0
BADGER PASS SNOTEL	6900	4/01/03	82	30.7	40.6	35.3	HAND CREEK	5030	3/26/03	33	11.0	--	--
BARRE CREEK	5500	3/26/03	98	36.6	40.1	43.1	HAND CREEK SNOTEL	5030	4/01/03	29	9.4	11.8	11.7
BARRE MIDWAY	4600	3/26/03	75	25.3	31.8	33.0	HARTS PASS SNOTEL	6500	4/01/03	92	26.0	47.9	46.3
BARRE TRAIL	3800	3/26/03	20	6.2	16.3	7.7	HEART LAKE TRAIL	4800	3/28/03	55	14.6	26.4	20.6
BARKER LAKES SNOTEL	8250	4/01/03	50	13.8	10.7	14.6	HELL ROARING DIVIDE	5770	3/27/03	75	25.7	30.2	29.5
BASIN CREEK SNOTEL	7180	4/01/03	---	7.7	5.0	8.7	HERRIG JUNCTION	4850	3/25/03	73	23.8	30.1	26.0
BASSOO PEAK	5150	3/27/03	27	7.2	12.4	9.7	HIGH RIDGE SNOTEL	4980	4/01/03	109	17.8	29.8	23.1
BEAVER CREEK TRAIL	2200	3/30/03	19	7.8	23.5	11.7	HOLBROOK	4530	4/01/03	18	7.4	11.4	8.2
BEAVER PASS	3680	3/30/03	53	22.0	34.1	28.8	HOODOO BASIN SNOTEL	6050	4/01/03	118	39.6	55.4	45.3
BERNE-MILL CREEK (d)	3170	3/31/03	61	21.0	34.7	28.1	HUMBOLDT GLCH SNOTEL	4250	4/01/03	---	4.2	19.9	11.2
BIG CREEK	6750	3/29/03	106	36.4	40.0	43.7	HURRICANE	4500	3/27/03	25	8.6	22.2	19.1
BIG WHITE MTN CAN.	5510	3/30/03	49	16.9	21.0	20.0	INTERGAARD	6450	3/30/03	20	6.8	4.8	7.7
BLACK MOUNTAIN	7750	3/28/03	51	15.2	9.2	14.6	ISINTOK LAKE CAN.	5100	3/27/03	18	4.3	6.6	7.2
BLACK PINE SNOTEL	7100	4/01/03	39	12.9	9.1	12.5	JUNE LAKE SNOTEL	3200	4/01/03	---	17.3	67.9	35.7
BLEWETT PASS #2	4270	3/26/03	29	12.0	17.5	14.7	KELLOGG PEAK	5560	3/29/03	49	19.1	38.0	29.2
BLEWETT PASS#2SNOTEL	4270	4/01/03	17	6.4	12.9	16.4	KISHENNEH	3890	3/30/03	19	5.8	11.2	6.8
BLUE LAKE	5900	3/30/03	55	20.2	25.6	23.7	KIT CARSON PASTURE	4950	3/24/03	31	10.6	7.4	8.1
BRENDA MINE CAN.	4450	4/01/03	---	9.6	16.5	12.5	KLESILKWA CAN.	3450	3/28/03	17	4.9	19.6	11.5
BRIEF	1600	3/28/03	0	.0	.0	2.5	KRAFT CREEK SNOTEL	4750	4/01/03	---	12.3	15.5	14.1
BROOKMERE CAN.	3000	3/29/03	17	5.7	7.1	7.9	LESTER CREEK	3100	3/27/03	48	15.8	35.2	21.4
BROWN TOP AM	6000	3/28/03	141	53.2	83.4	60.8	LIGHTNING LAKE CAN.	3700	3/28/03	29	9.4	13.0	12.0
BRUSH CREEK TIMBER	5000	3/26/03	16	4.7	8.9	8.1	LOGAN CREEK	4300	3/26/03	17	4.6	7.5	6.7
BULL MOUNTAIN	6600	3/27/03	19	6.1	4.5	5.9	LOLO PASS SNOTEL	5240	4/01/03	91	34.3	34.1	30.3
BUMPING LAKE (NEW)	3400	3/27/03	39	13.8	19.6	17.6	LONE PINE SNOTEL	3800	4/01/03	---	24.5	60.1	36.4
BUMPING RIDGE SNOTEL	4600	4/01/03	---	21.6	37.1	28.6	LOOKOUT SNOTEL	5140	4/01/03	57	20.6	44.9	31.8
BUNCHGRASS MDWSNOTEL	5000	4/01/03	---	29.3	32.7	30.2	LOST HORSE	5940	4/01/03	---	30.6E	27.2	30.7
BUTTE CREEK	4070	3/27/03	20	7.4	6.4	8.3	LOST HORSE MTN CAN.	6300	3/29/03	22	6.9	--	9.4
CAMP MISERY	6400	4/01/03	114	42.3	51.6	49.3	LOST HORSE SNOTEL	5000	4/01/03	45	18.3	23.4	18.3
CARMI CAN.	4100	3/30/03	7	2.4	4.6	5.6	LOST LAKE SNOTEL	6110	4/01/03	---	43.8	74.1	60.0
CAYUSE PASS	5300	4/01/03	---	70.0E	88.0	79.8	LOWER SANDS CREEK #2	3120	3/27/03	25	9.2	28.6	18.9
CEDAR GROVE	3760	3/25/03	25	8.7	14.2	11.4	LUBRECHT FOREST NO 3	5450	3/27/03	21	5.8	5.8	5.7
CHESSMAN RESERVOIR	6200	3/31/03	7	2.1	2.4	3.5	LUBRECHT FOREST NO 4	4650	3/27/03	6	1.6	2.6	1.3
CHICKEN CREEK	4060	3/25/03	40	13.6	16.9	15.2	LUBRECHT FOREST NO 6	4040	3/27/03	5	1.6	2.4	1.6
CHINAIKUM G.S.	2500	3/31/03	14	4.9	10.0	9.2	LUBRECHT HYDROPLOT	4200	3/27/03	12	4.4	5.5	2.9
CITY CABIN	2390	4/01/03	---	5.5E	17.0	11.1	LUBRECHT SNOTEL	4680	4/01/03	13	5.2	5.4	3.6
COLOCKUM PASS	5370	3/24/03	44	16.0	15.9	16.3	LYMAN LAKE SNOTEL	5900	4/01/03	---	55.6	73.3	65.4
COMBINATION SNOTEL	5600	4/01/03	---	5.3	4.5	4.9	LYNN LAKE	4000	3/27/03	47	18.7	48.3	20.4
COPPER BOTTOM SNOTEL	5200	4/01/03	33	12.2	14.3	11.0	MARIAS PASS	5250	3/27/03	36	13.2	22.3	16.8
COPPER CAMP	6950	3/27/03	89	30.0	33.8	--	MARTEN LAKE AM	3600	4/01/03	---	49.0E	100.0	71.7
COPPER CREEK	5700	3/27/03	40	13.8	16.2	13.3	MCCULLOCH CAN.	4200	4/01/03	6	2.0	6.1	6.1
COPPER MOUNTAIN	7700	3/29/03	38	10.5	8.0	11.2	MEADOWS CABIN	1900	3/29/03	5	1.4	8.6	4.0
CORNER CREEK	3150	3/27/03	3	.6	12.9	5.9	MEADOWS PASS SNOTEL	3240	4/01/03	---	17.1	43.8	23.9
CORRAL PASS SNOTEL	6000	4/01/03	---	31.3	42.1	34.9	MERRITT	2140	3/31/03	9	2.3	14.1	12.1
COTTONWOOD CREEK	6400	3/28/03	28	8.2	5.2	8.3	MICA CREEK SNOTEL	4750	4/01/03	45	17.0	35.8	25.1
COUGAR MTN. SNOTEL	3200	4/01/03	15	5.6	31.7	17.7	MINERAL CREEK	4000	3/26/03	45	15.2	19.4	17.4
COX VALLEY	4500	3/27/03	79	29.6	48.3	38.7	MISSEZULA MTN CAN.	5080	3/27/03	18	4.8	10.0	9.5
COYOTE HILL	4200	3/28/03	23	7.7	10.2	8.7	MISSION RIDGE	5000	3/31/03	41	16.2	17.4	17.4
DAILY CREEK SNOTEL	5780	4/01/03	38	13.4	8.9	11.1	MORRISSEY RIDGE CAN.	6100	4/01/03	---	26.6	34.1	27.8
DEER PARK	5200	3/27/03	33	11.7	22.5	18.8	MORSE LAKE SNOTEL	5400	4/01/03	---	52.1	56.1	55.5
DESERT MOUNTAIN	5600	4/01/03	40	13.6	15.3	14.7	MOSES MOUNTAIN (2)	4800	3/28/03	34	13.3	14.7	22.7
DEVILS PARK	5900	3/28/03	102	38.8	57.6	44.2	MOSES MTN SNOTEL	4800	4/01/03	---	15.1	17.2	15.9
DISCOVERY BASIN	7050	3/26/03	38	12.0	6.7	10.4	MOSES PEAK	6650	3/28/03	77	27.6	23.1	15.0
DIX HILL	6400	3/29/03	35	12.8	10.3	10.3	MOSQUITO RDG SNOTEL	5200	4/01/03	---	31.0	44.2	35.8
DOMMERIE FLATS	2200	3/26/03	0	.0	4.3	3.8	MOULTON RESERVOIR	6850	3/31/03	27	8.1	4.6	6.9
EAST FORK R.S.	5400	3/26/03	23	7.4	3.8	4.7	MOUNT CRAG SNOTEL	4050	4/01/03	53	22.9	36.2	30.8
EAST RAGGED SADDLE	3740	4/01/03	15	6.3	28.6	18.1	MT. KOBAU CAN.	5500	3/30/03	34	11.7	12.6	12.5
EASY PASS AM	5200	4/01/03	---	56.0E	105.0	81.0	MOUNT GARDNER SNOTEL	2860	4/01/03	---	4.2	28.8	13.0
EL DORADO MINE	7800	3/31/03	63	22.2	14.0	20.2	MUTTON CREEK #1	5700	3/25/03	42	15.0	14.1	13.9
ELBOW LAKE SNOTEL	3200	4/01/03	48	21.6	54.9	39.2	N.F. ELK CR SNOTEL	6250	4/01/03	46	14.1	11.0	12.4
EMERY CREEK	4350	4/01/03	38	13.7	17.8	--	NEZ PERCE CMP SNOTEL	5650	4/01/03	---	17.8	15.1	14.7
EMERY CREEK SNOTEL	4350	4/01/03	---	14.0	15.2	15.3	NEZ PERCE PASS	6570	3/25/03	55	19.2	14.6	17.8
ENDERBY CAN.	5800	3/31/03	97	36.2	46.0	40.1	NOISY BASIN	6040	4/01/03	103	36.9	45.4	--
ESPERON CK. MID CAN.	4250	3/30/03	26	8.3	14.4	14.6	NOISY BASIN SNOTEL	6040	4/01/03	98	36.2	40.5	40.9
ESPERON CK. UP CAN.	5050	3/30/03	34	10.0	19.0	17.1	NORTH FORK JOCKO	6330	3/29/03	111	38.4	44.9	--
FARRON CAN.	4000	3/27/03	31	9.6	12.2	12.5	OLALLIE MDWS SNOTEL	3960	4/01/03	---	41.6	65.6	55.9
FATTY CREEK	5500	3/29/03	69	21.0	23.6	24.3	OLALLIE MEADOWS	3630	4/01/03	---	27.0E	58.2	38.7
FISH CREEK	8000	3/27/03	33	8.4	6.1	9.9	OPHIR PARK	7150	3/29/03	52	16.8	12.3	16.7
FISH LAKE	3370	3/26/03	62	24.7	39.4	31.5	OYAMA LAKE CAN.	4100	3/31/03	122	3.5	7.2	6.7
FISH LAKE SNOTEL	3370	4/01/03	57	22.6	35.4	34.5	PALISADE CREEK	8250	4/01/03	---	31.7E	30.4	29.8
FLATTOP MTN SNOTEL	6300	4/01/03	120	41.8	51.1	45.1	PARADISE PARK SNOTEL	5500	4/01/03	---	53.1	84.5	71.9
FLEECER RIDGE	7500	3/27/03	33	10.8	9.5	10.9	PARK CK RIDGE SNOTEL	4600	4/01/03	84	40.0	61.5	47.6
FOURTH OF JULY SUM	3200	3/28/03	0	.0	16.5	5.7	PETERSON MDW SNOTEL	7200	4/01/03	---	11.8	6.3	10.5
FRED BURR PASS	8000	3/26/03	70	23.3	21.0	23.9	PIGTAIL PEAK SNOTEL	5900	4/01/03	127	48.4	18.0	53.2
FREEZEOUT CK. TRAIL	3500	3/29/03	22	8.2	13.9	11.3	PIKE CREEK	5930	3/25/03	60	19.6	29.7	--
FROHNER MDWS SNOTEL	6480	4/01/03	28	8.9	6.3	8.0	PIKE CREEK SNOTEL	5930	4/01/03	60	21.7	30.6	27.5
GOAT CREEK	3600	3/27/03	8	2.7	3.5	3.6	PIPESTONE PASS	7200	3/29/03	16	4.2	2.9	5.7
GOLD CREEK LAKE	7200	3/31/03	47	16.2	10.6	14.7	POPE RIDGE SNOTEL	3540	4/01/03	42	15.3	18.0	18.4
GRASS MOUNTAIN #2	2900	3/27/03	0	.0	25.0	10.0	POSTILL LAKE CAN.	4200	3/31/03	20	6.5	8.9	8.8
GRAVE CREEK	4300	3/31/03	38	14.5	18.0	--	POTATO HILL SNOTEL	4500	4/01/03	---	24.1	37.0	25.3
GRAVE CRK SNOTEL	4300	4/01/03	---	15.2	17.1	15.6	QUARTZ PEAK SNOTEL	4700	4/01/03	---	13.5	28.0	21.2

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1971-00	SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1971-00
RAGGED MOUNTAIN	4200	4/01/03	18	7.3	30.9	17.1	STRYKER BASIN	6180	3/25/03	86	27.9	36.8	31.9
RAGGED RIDGE	3330	3/28/03	0	.0	13.2	4.1	STUART MOUNTAIN	7400	3/29/03	97	34.9	35.3	--
RAINY PASS SNOTEL	4780	4/01/03	---	28.4	49.0	44.0	SUMMERLAND RES CAN.	4200	3/27/03	18	5.0	9.4	8.9
REX RIVER SNOTEL	1900	4/01/03	---	15.9	55.6	31.2	SUMMIT G.S.	4600	4/01/03	---	7.8E	6.7	7.4
ROCKER PEAK SNOTEL	8000	4/01/03	48	14.4	10.3	14.3	SUNSET SNOTEL	5540	4/01/03	---	16.2	27.2	31.5
ROLAND SUMMIT	5120	4/01/03	66	26.5	53.4	36.4	SURPRISE LKS SNOTEL	4250	4/01/03	---	38.9	58.4	46.1
RUSTY CREEK	4000	3/25/03	14	5.1	4.2	5.5	TEN MILE LOWER	6600	3/31/03	25	7.8	4.9	7.0
SADDLE MTN SNOTEL	7900	4/01/03	90	28.7	23.0	25.8	TEN MILE MIDDLE	6800	3/31/03	37	11.2	7.2	11.4
SAGE CREEK SADDLE	4080	3/27/03	26	8.3	31.1	16.6	THUNDER BASIN	4200	3/28/03	54	16.8	28.6	21.9
SALMON MDWS SNOTEL	4500	4/01/03	25	9.4	10.1	11.1	TINKHAM CREEK SNOTEL	3000	4/01/03	---	16.8	40.9	30.0
SASSE RIDGE SNOTEL	4200	4/01/03	54	28.5	45.0	37.3	TOGO	3370	3/26/03	13	4.0	12.2	10.7
SAVAGE PASS SNOTEL	6170	4/01/03	91	30.6	28.0	26.5	TOUCHET SNOTEL	5530	4/01/03	60	24.5	42.8	34.7
SAWMILL RIDGE	4700	3/27/03	61	22.5	38.7	33.5	TRINKUS LAKE	6100	3/30/03	102	38.2	44.7	42.0
SHEEP CANYON SNOTEL	4050	4/01/03	---	14.7	51.9	37.8	TROUGH #2 SNOTEL	5310	4/01/03	27	11.5	8.2	10.0
SHERWIN SNOTEL	3200	4/01/03	---	1.5	18.3	10.1	TROUT CREEK CAN.	5650	3/24/03	17	5.1	7.4	7.2
SILVER STAR MTN CAN.	5600	3/29/03	74	25.2	32.6	29.9	TRUMAN CREEK	4060	3/28/03	8	2.4	5.9	3.7
SKALKAHO SNOTEL	7260	4/01/03	75	25.5	23.7	24.3	TUNNEL AVENUE	2450	3/27/03	30	11.4	27.2	19.2
SKITWISH RIDGE	5110	3/27/03	65	21.8	42.4	30.2	TV MOUNTAIN	6800	3/29/03	56	16.1	18.6	18.5
SKOOKUM CREEK SNOTEL	3920	4/01/03	---	8.4	59.0	26.3	TWELVEMILE SNOTEL	5600	4/01/03	45	17.0	19.6	17.5
SLIDE ROCK MOUNTAIN	7100	3/31/03	49	16.8	12.0	15.5	TWIN CAMP	4100	3/27/03	43	15.5	27.3	24.1
SOURDOUGH GULCH SNTL	4000	4/01/03	0	.0	.0	--	TWIN CREEKS	3580	3/30/03	19	6.7	11.6	9.6
SPENCER MDW SNOTEL	3400	4/01/03	---	15.3	54.7	30.8	TWIN LAKES	2700	3/25/03	12	5.2	6.6	4.6
SPIRIT LAKE SNOTEL	3100	4/01/03	---	.0	14.8	--	TWIN LAKES SNOTEL	6400	4/01/03	109	45.0	46.2	39.7
SPOTTED BEAR MTN.	7000	3/30/03	38	12.6	14.1	14.1	TWIN SPIRIT DIVIDE	3480	4/01/03	0	.0	17.8	12.1
SOURDOUGH GULCH SNTL	4000	4/01/03	0	.0	.0	--	UPPER HOLLAND LAKE	6200	3/30/03	97	35.3	38.7	34.6
STAHL PEAK SNOTEL	6030	4/01/03	---	33.1	41.5	35.3	UPPER WHEELER SNOTEL	4400	4/01/03	31	12.5	10.6	13.1
STAMPEDE PASS SNOTEL	3860	4/01/03	78	31.6	59.3	45.3	VASEUX CREEK CAN.	4250	3/27/03	10	1.7	4.3	6.2
STEMILT SLIDE	5000	3/28/03	33	11.9	13.3	12.9	WARM SPRINGS SNOTEL	7800	4/01/03	---	23.6	18.5	21.2
STEMPLE PASS	6600	3/28/03	36	9.2	9.4	10.2	WATSON LAKES AM	4500	4/01/03	---	42.5	--	61.7
STEVENS PASS SNOTEL	4070	4/01/03	81	30.8	47.2	42.6	WEASEL DIVIDE	5450	3/31/03	71	26.7	40.0	32.9
STEVENS PASS SAND SD	3700	3/31/03	65	25.3	37.1	33.3	WELLS CREEK SNOTEL	4200	4/01/03	---	24.2	38.5	32.2
STORM LAKE	7780	3/26/03	46	12.9	9.7	13.3	WHITE PASS ES SNOTEL	4500	4/01/03	---	17.6	28.0	23.9
STRANGER MOUNTAIN	4230	3/26/03	22	8.4	15.0	12.2	WHITE ROCKS MTN CAN.	7200	3/31/03	41	13.5	26.6	23.1

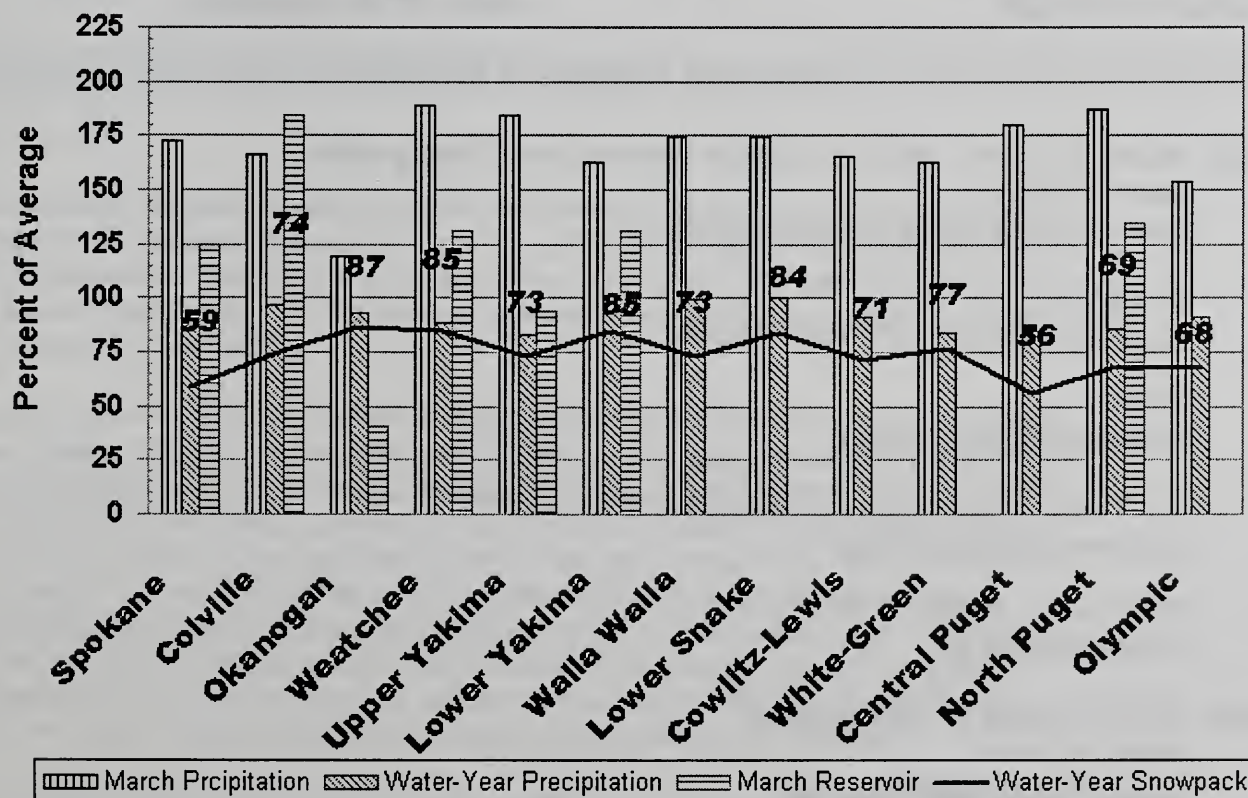
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April 1, 2003 -

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Snowpack, Precipitation and Reservoir Conditions at a Glance

(Water Year = October 1, 2002 - Current Date)





Natural Resources Conservation Service

Washington State
Snow, Water and Climate Services

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Helpful Internet Addresses

NRCS Snow Survey and Climate Services Homepages

Washington:
<http://www.wa.nrcs.usda.gov/snow/snow.htm>

Oregon:
<http://www.or.nrcs.usda.gov/snow/snow.htm>

Idaho:
<http://idsnow.id.nrcs.usda.gov>

National Water and Climate Center (NWCC):
<http://www.wcc.nrcs.usda.gov>

NWCC Anonymous FTP Server:
<ftp.wcc.nrcs.usda.gov>

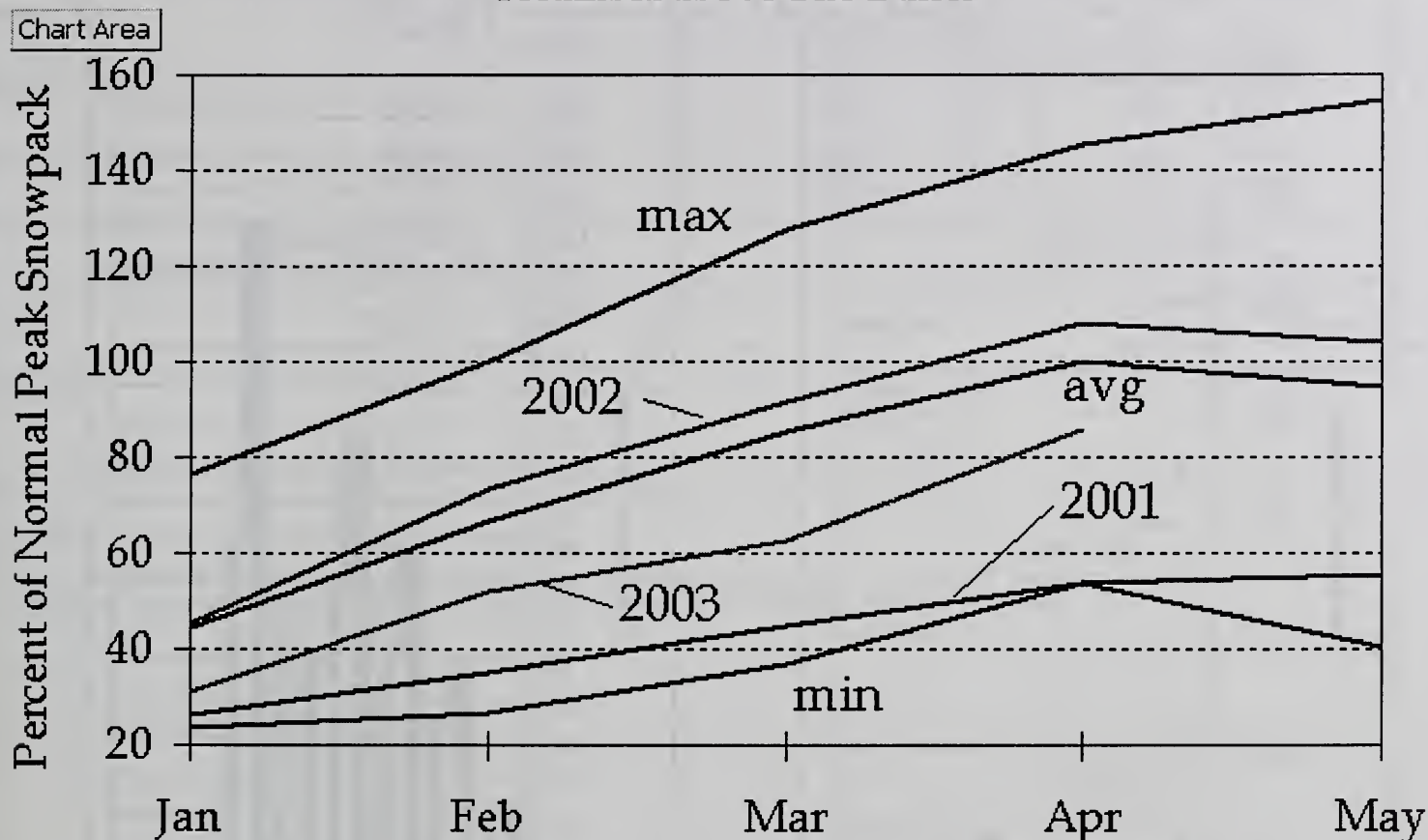
USDA-NRCS Agency Homepages

Washington:
<http://www.wa.nrcs.usda.gov/nrcs>

NRCS National:
<http://www.ftw.nrcs.usda.gov>

Columbia Basin Snowpack Summary

Columbia above The Dalles



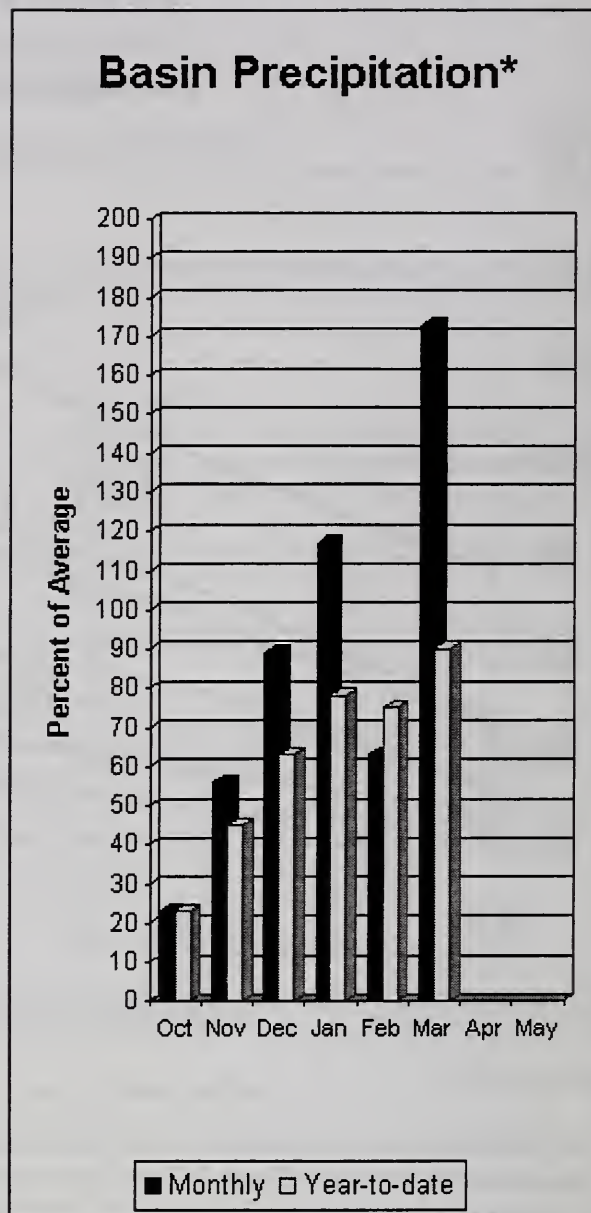
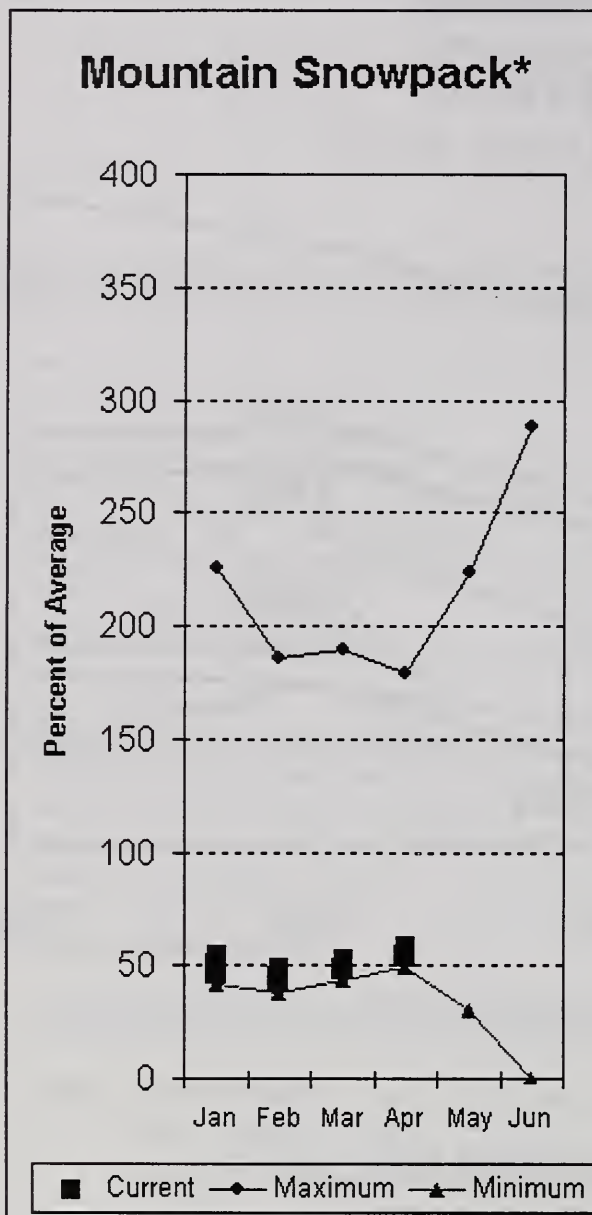
April 1, 2003

The Columbia Basin snowpack above The Dalles increased to 86 percent of average on April 1, compared to 74 percent on March 1. The snowpack above Castlegar increased to 83 percent, up 11 percent from March 1. The snowpack above Grand Coulee increased to 85 percent, up 13 percent from March 1. The Snake River snowpack above Ice Harbor increased to 94 percent, up 14 percent from March 1.

Most of the watersheds in the Columbia Basin received heavy amounts of precipitation during March. Many SNOTEL sites reported over 200 percent of average precipitation amounts in the Idaho panhandle and the Clearwater, Flathead, and Clark Fork basins. Many SNOTEL sites in the Salmon, Boise/Payette, Upper Snake, Yakima, and northeastern Oregon basins reported over 150 percent of average precipitation. As a result, the Kootenai River Basin snowpack increased 17 percent over the March 1 composite, the Pend Oreille increased 19 percent, the Spokane increased 12 percent, the Yakima increased 11 percent, the Salmon increased 13 percent, and the Clearwater River Basin increased a whopping 24 percent. Snowpack increases of about 4 to 8 percent were common in other watersheds of the Columbia Basin. Only the central Oregon and Kettle snowpacks did not increase from last month.

The percent of peak index at The Dalles increased from 63 percent to 86 percent of average. March was a good month (in terms of increased water supply prospects) over the Columbia Basin.

Spokane River Basin



*Based on selected stations

The April 1 forecasts for summer runoff within the Spokane River Basin are 73% of average near Post Falls and 76% at Long Lake. The forecast is based on a basin snowpack that is 59% of average and precipitation that is 90% of average for the water year. Precipitation for March was above normal at 173% of average. Streamflow on the Spokane River at Long Lake, was 101% of average for March. April 1 storage in Coeur d'Alene Lake, was 211,500-acre feet, 125% of average and 89% of capacity. Snowpack at Quartz Peak SNOTEL site was 64% of average with 13.5 inches of water content. Average temperatures in the Spokane basin were 3 degrees above normal for March and 2 degrees above for the water year.

For more information contact your local Natural Resources Conservation Service office.

Spokane River Basin

SPOKANE RIVER BASIN Streamflow Forecasts - April 1, 2003

		<===== Drier ===== Future Conditions ===== Wetter =====>>						
Forecast Point	Forecast Period	=====		Chance Of Exceeding *		=====		30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
SPOKANE near Post Falls (2)	APR-SEP	1450	1740	1940	73	2140	2430	2650
	APR-JUL	1400	1680	1870	73	2060	2340	2552
SPOKANE at Long Lake (2)	APR-JUL	1570	1910	2140	75	2370	2710	2851
	APR-SEP	1720	2080	2320	76	2560	2920	3072

SPOKANE RIVER BASIN Reservoir Storage (1000 AF) - End of March					SPOKANE RIVER BASIN Watershed Snowpack Analysis - April 1, 2003			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
COEUR D'ALENE	238.5	211.5	142.5	169.5	SPOKANE RIVER	20	41	59
					NEWMAN LAKE	2	33	53

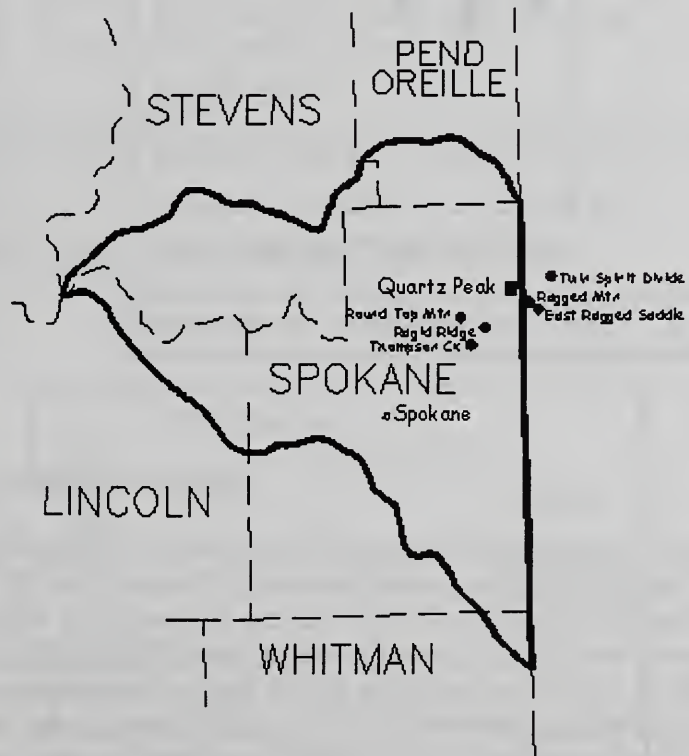
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

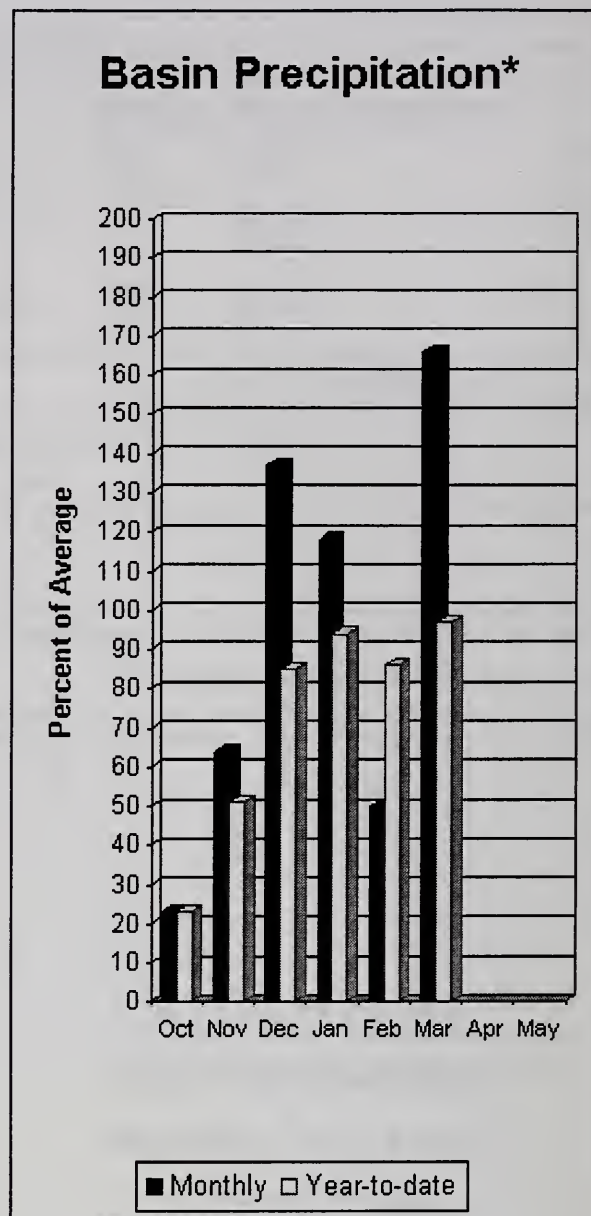
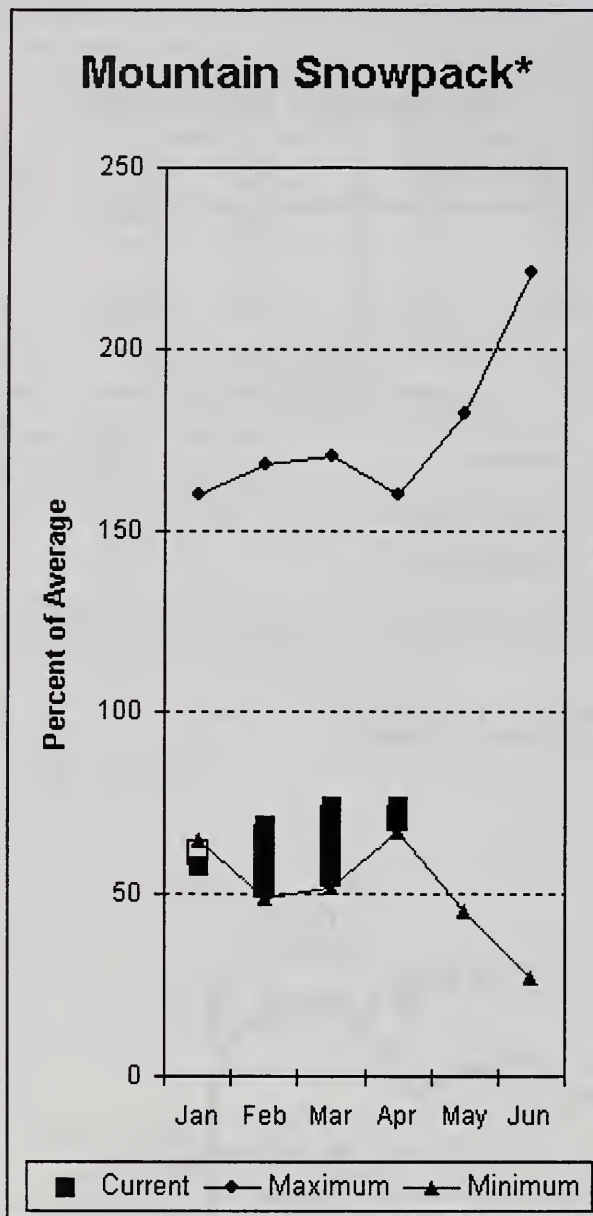
- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
 (2) - The value is natural volume - actual volume may be affected by upstream water management.

Spokane River Basin
Percent of Average
April 1, 2003

Snowpack - 59%
Precipitation - 90%
Reservoir Capacity - 125%



Colville - Pend Oreille River Basins



*Based on selected stations

The April – September average forecast for the Kettle River streamflow is 79%, Colville at Kettle Falls is 85%, and Priest River near the town of Priest River is 84%. March streamflow was 124% of average on the Pend Oreille River, 106% on the Columbia at Birchbank and 91% on the Kettle River. April 1 snow cover was 93% of average in the Pend Oreille Basin River Basin, 54% in the Colville River Basin and 79% at 7 sites in the Kettle River Basin. Bunchgrass Meadows SNOTEL site had 29.3 inches of snow water on the snow pillow. Normally Bunchgrass would have 30.2 inches on April 1. Precipitation during March was 166% of average, bringing the year-to-date precipitation to 97% of average. Reservoir storage in Roosevelt Lake was reported to be 184% of average and 84% of capacity on April 1. Average temperatures were 3 degrees above normal for March and 2 degrees above for the water year.

For more information contact your local Natural Resources Conservation Service office.

Colville - Pend Oreille River Basins

Streamflow Forecasts - April 1, 2003

Forecast Point	Forecast Period	<===== Drier ===== Future Conditions ===== Wetter =====>						30-Yr Avg. (1000AF)
		Chance Of Exceeding *						
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
PEND OREILLE Lake Inflow (2)	APR-JUL	8350	9570	10400	82	11230	12450	12700
	APR-SEP	9060	10390	11300	81	12210	13540	13900
PRIEST near Priest River (1,2)	APR-JUL	550	640	680	84	720	810	814
	APR-SEP	505	655	725	84	795	945	868
PEND OREILLE bl Box Canyon (2)	APR-JUL	8520	9640	10400	81	11160	12280	12900
	APR-SEP	9160	10490	11400	81	12310	13640	14100
CHAMOKANE CREEK near Long Lake	MAY-AUG	3.4	5.5	7.0	69	8.5	10.6	10.2
COLVILLE at Kettle Falls	APR-SEP	84	105	120	85	135	157	141
	APR-JUL	77	97	110	86	123	143	128
KETTLE near Laurier	APR-SEP	1260	1430	1550	79	1670	1840	1972
	APR-JUL	1220	1370	1470	78	1570	1720	1874
COLUMBIA at Birchbank (1,2)	APR-JUL	25608	28491	29800	85	31110	33990	34900
	APR-SEP	31849	35460	37100	85	38740	42350	43500
COLUMBIA at Grand Coulee Dm (1,2)	APR-SEP	44452	50330	53000	83	55670	61550	63990
	APR-JUL	37332	42261	44500	83	46740	51670	53850

COLVILLE - PEND OREILLE RIVER BASINS Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage ***		
		This Year	Last Year	Avg
ROOSEVELT	5232.0	4400.4	2810.9	2397.5
BANKS	715.0	684.5	665.8	664.5

COLVILLE - PEND OREILLE RIVER BASINS Watershed Snowpack Analysis - April 1, 2003

Watershed	Number of Data Sites	This Year as % of	
		Last Yr	Average
COLVILLE RIVER	2	46	54
PEND OREILLE RIVER	11	77	88
KETTLE RIVER	7	86	79

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

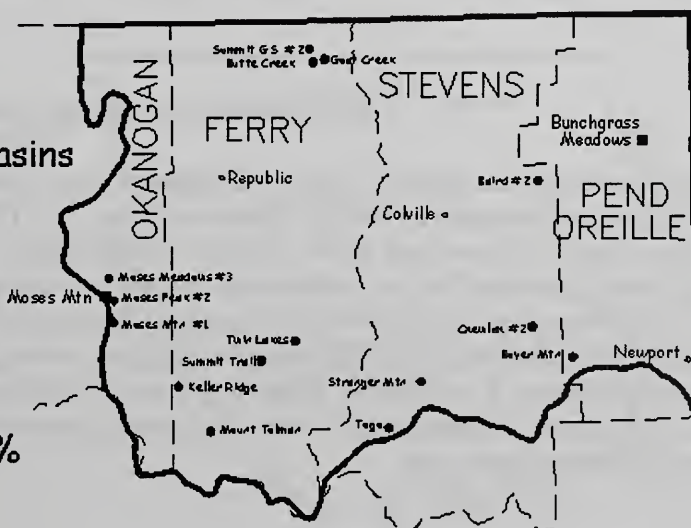
The average is computed for the 1971-2000 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

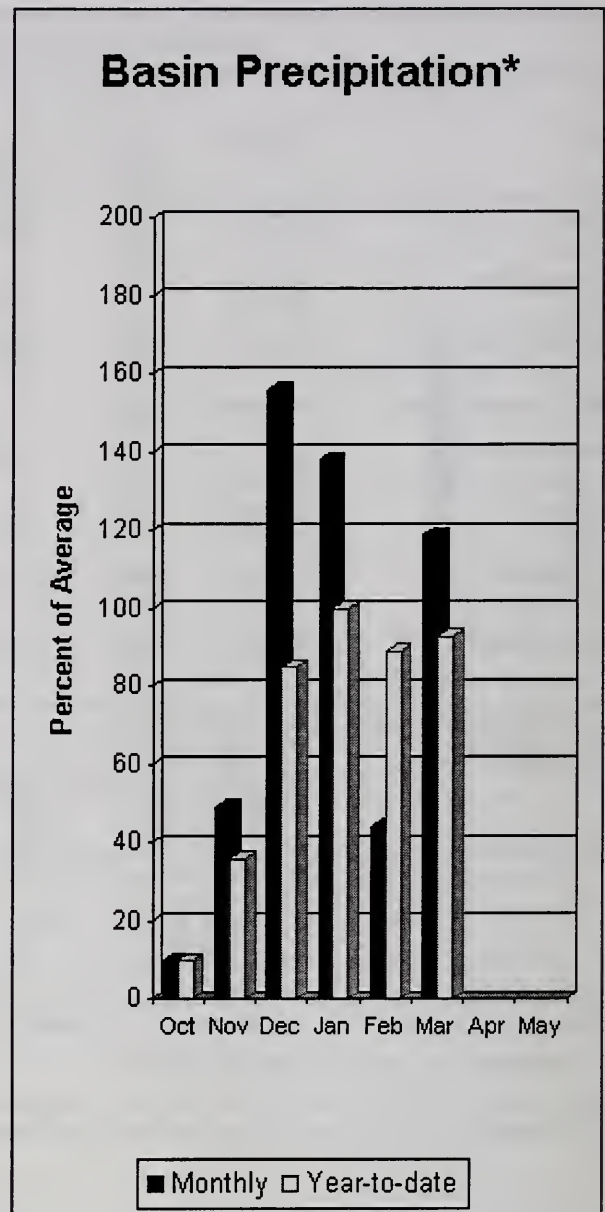
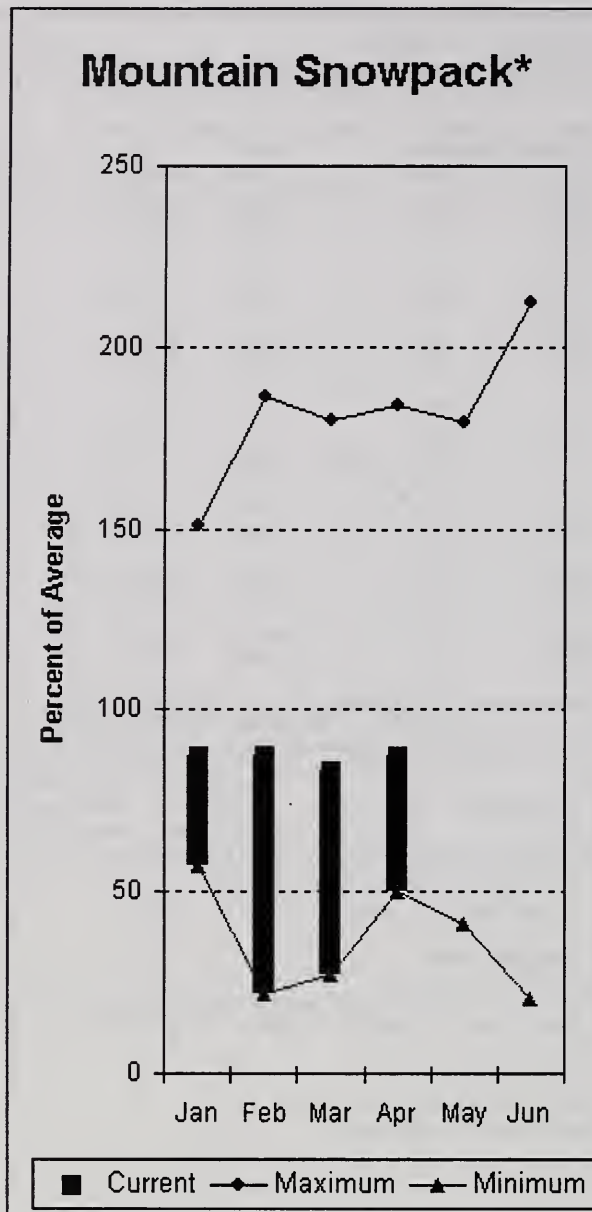
(2) - The value is natural volume - actual volume may be affected by upstream water management.

Colville-Pend Oreille River Basins
Percent of Average
April 1, 2003

Snowpack - 74%
Precipitation - 97%
Reservoir Capacity - 184%



Okanogan - Methow River Basins



*Based on selected stations

Summer runoff average forecast for the Okanogan River is 66%, Similkameen River is 70%, Methow River is 81%, Salmon Creek is 79% and Beaver Creek is 83%. April 1 snow cover on the Okanogan was 73% of average and Methow was 69%. March precipitation in the Okanogan-Methow was 119% of average, with precipitation for the water year at 93% of average. March streamflow for the Methow River was 56% of average, 41% for the Okanogan River and 64% for the Similkameen. Snow-water content at Salmon Meadows SNOTEL was 9.4 inches. Average for this site is 11.1 inches on April 1. Combined storage in the Conconully Reservoirs was 7,300-acre feet, which is 31% of capacity and 41% of the April 1 average. Temperatures were 3 degrees above normal for the past month and 3 degrees above normal for the water year.

For more information contact your local Natural Resources Conservation Service office.

Okanogan - Methow River Basins

Streamflow Forecasts - April 1, 2003

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						
		=====		Chance Of Exceeding *		=====		30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
SIMILKAMEEN near Nighthawk (1)	APR-JUL	630	850	950	70	1050	1270	1350
	APR-SEP	655	910	1020	70	1130	1390	1450
OKANOGAN near Tonasket (1)	APR-JUL	495	875	1050	67	1220	1610	1580
	APR-SEP	610	995	1170	66	1340	1730	1766
SALMON CREEK near Conconully	APR-JUL	4.1	11.1	15.8	79	21	28	20
	APR-SEP	4.3	11.6	16.6	79	22	29	21
BEAVER CREEK below SF near Twisp	APR-SEP	5.7	8.3	10.0	83	11.7	14.3	12.1
	APR-JUL	4.9	7.4	9.1	82	10.8	13.3	11.1
METHOW RIVER near Pateros	APR-SEP	610	725	800	81	875	990	985
	APR-JUL	635	700	740	81	780	845	911

OKANOGAN - METHOW RIVER BASINS Reservoir Storage (1000 AF) - End of March					OKANOGAN - METHOW RIVER BASINS Watershed Snowpack Analysis - April 1, 2003			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
SALMON LAKE	10.5	3.1	3.5	8.4	OKANOGAN RIVER	22	69	73
CONCONULLY RESERVOIR	13.0	4.2	3.6	9.2	OMAK CREEK	3	102	104
					SANPOIL RIVER	1	79	113
					SIMILKAMEEN RIVER	4	61	66
					TOATS COULEE CREEK	1	0	0
					CONCONULLY LAKE	3	104	97
					METHOW RIVER	5	67	69

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

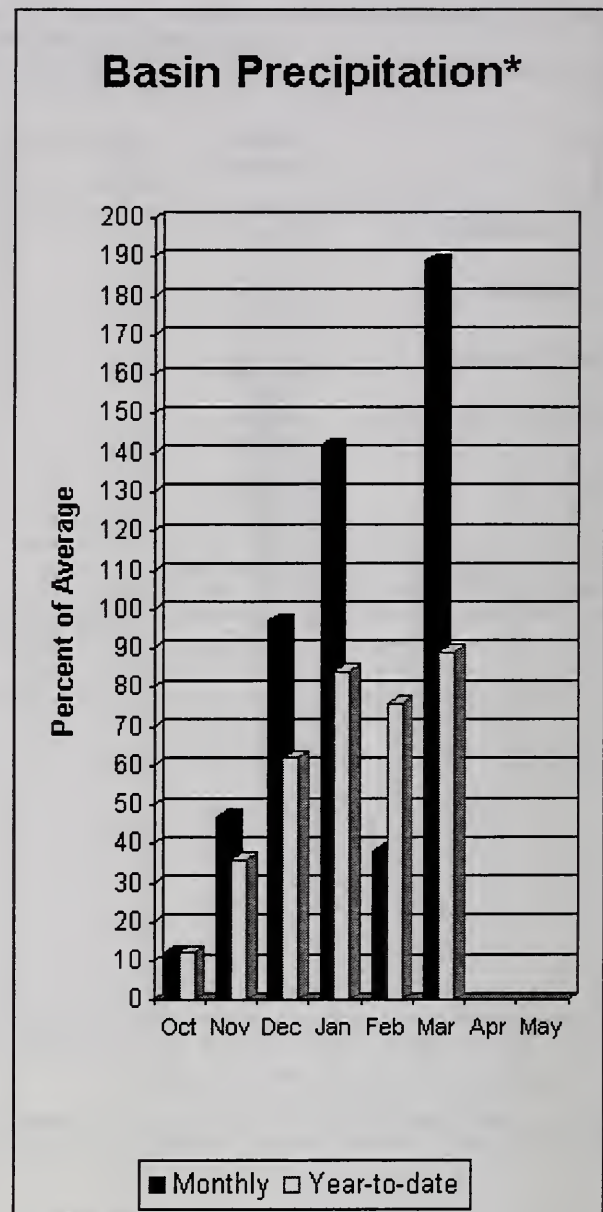
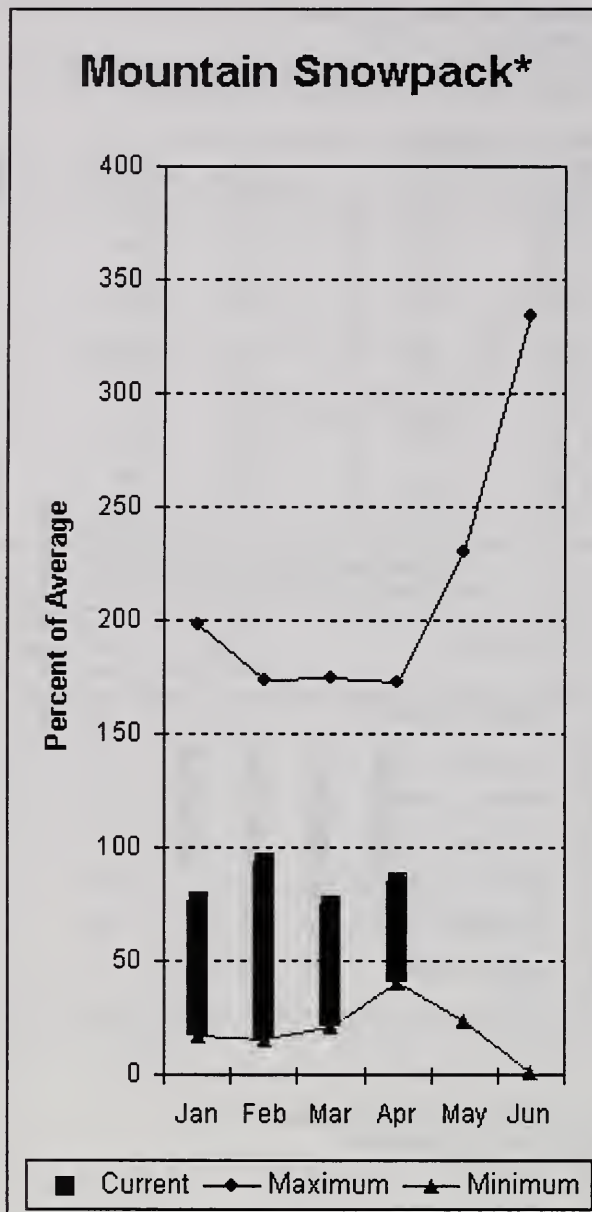
- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
 (2) - The value is natural volume - actual volume may be affected by upstream water management.

Okanogan-Methow River Basins
 Percent of Average
 April 1, 2003

Snowpack - 87%
 Precipitation - 93%
 Reservoir Capacity - 41%



Wenatchee - Chelan River Basins



*Based on selected stations

Precipitation during March was 189% of average in the basin and 89% for the year-to-date. Runoff for Entiat River is forecast to be 75% of average for the summer. The April-September average forecast for Chelan River is 76%, Wenatchee River at Plain is 79% and Stehekin is 79%. Icicle, Stemilt and Squilchuck creeks are all expected to fall into the same forecast range. March average streamflows on the Chelan River were 113% and on the Wenatchee River 110%. April 1 snowpack in the Wenatchee River Basin was 75% of average; the Chelan, 79%; the Entiat, 73%; Stemilt Creek, 94% and Colockum Creek, 105%. Reservoir storage in Lake Chelan was 284,200-acre feet, 131% of April 1 average and 42% of capacity. Lyman Lake SNOTEL had the most snow water with 55.6 inches of water. This site would normally have 65.4 inches on April 1. Temperatures were 3 degrees above normal for March and 2-3 degrees above normal for the water year.

For more information contact your local Natural Resources Conservation Service office.

Wenatchee - Chelan River Basins

Streamflow Forecasts - April 1, 2003

Forecast Point	Forecast Period	<<===== Drier =====		Future Conditions		===== Wetter =====>>		30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	Chance Of Exceeding * (% AVG.)	30% (1000AF)	10% (1000AF)	
CHELAN RIVER near Chelan	APR-SEP	765	845	900	76	960	1040	1185
	APR-JUL	680	750	795	76	840	910	1046
STEHEKIN near STEHEKIN	APR-SEP	555	610	650	79	690	745	827
	APR-JUL	475	520	550	79	580	625	699
ENTIAT RIVER near Ardenvoir	APR-SEP	153	168	178	75	188	205	238
	APR-JUL	140	154	164	76	174	188	216
WENATCHEE at Plain	APR-SEP	805	890	950	79	1010	1090	1198
	APR-JUL	735	805	850	79	895	960	1078
WENATCHEE R. at Peshastin	APR-SEP	883	1125	1290	79	1455	1695	1635
	APR-JUL	704	981	1170	79	1359	1635	1481
STEMILT nr Wenatchee (miners in)	MAY-SEP	47	73	91	66	109	135	138
ICICLE CREEK near Leavenworth	APR-SEP	240	265	280	81	295	320	345
	APR-JUL	230	245	260	82	275	290	318
COLUMBIA R. bl Rock Island Dam (2)	APR-SEP	50622	54955	57900	83	60840	65180	69540
	APR-JUL	41124	45814	49000	83	52190	56880	59020

WENATCHEE - CHELAN RIVER BASINS Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage ***		
		This Year	Last Year	Avg
CHELAN LAKE	676.1	284.2	187.2	216.3

WENATCHEE - CHELAN RIVER BASINS Watershed Snowpack Analysis - April 1, 2003

Watershed	Number of Data Sites	This Year as % of	
		Last Yr	Average
CHELAN LAKE BASIN	4	66	79
ENTIAT RIVER	2	85	73
WENATCHEE RIVER	13	69	75
SQUILCHUCK CREEK	0	0	0
STEMILT CREEK	2	102	94
COLOCKUM CREEK	2	114	105

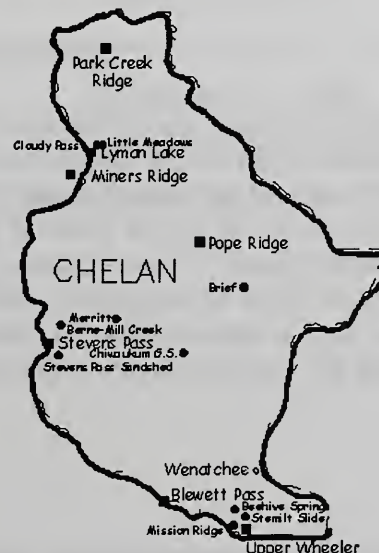
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The average is computed for the 1971-2000 base period.

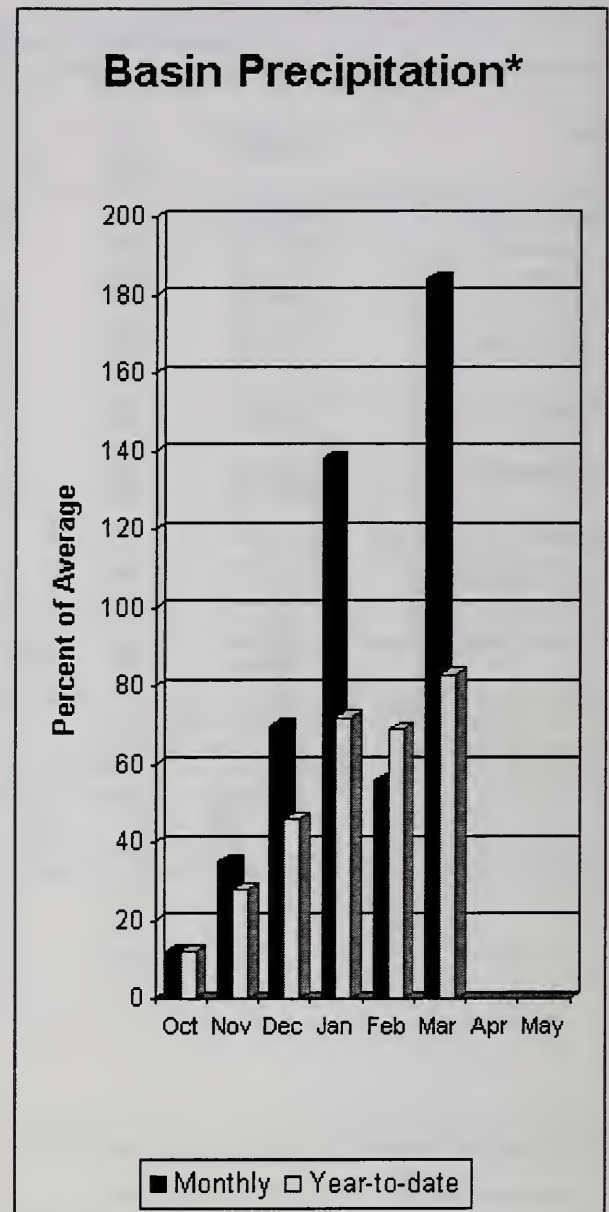
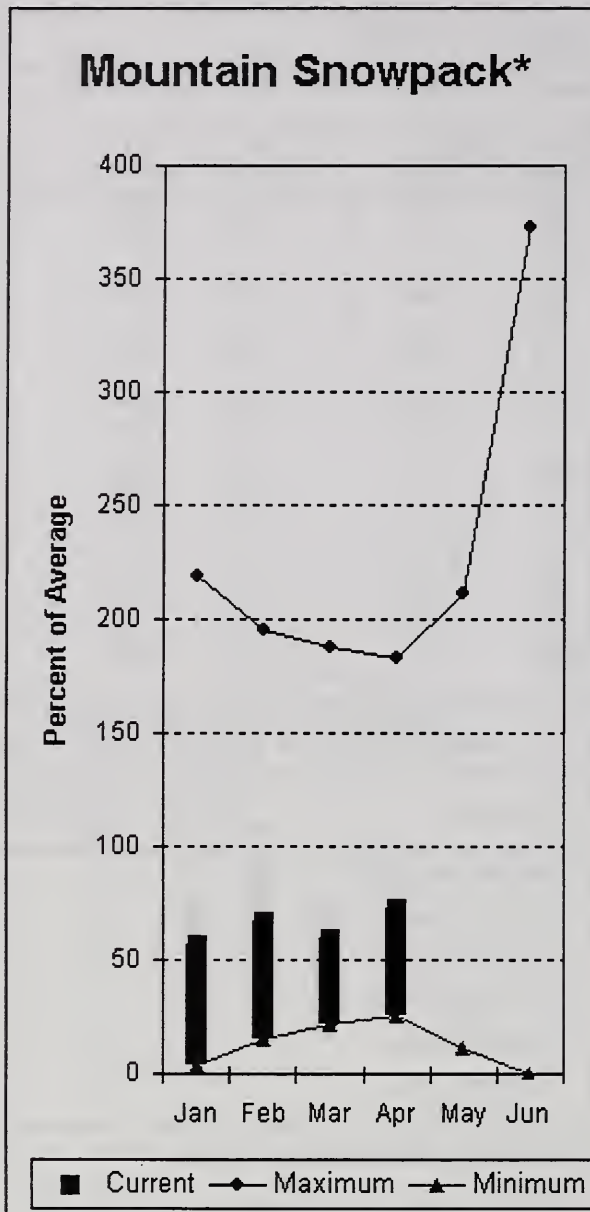
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 (2) - The value is natural volume - actual volume may be affected by upstream water management.

Wenatchee-Chelan River Basins
Percent of Average
April 1, 2003

Snowpack - 85%
Precipitation - 89%
Reservoir Capacity - 131%



Upper Yakima River Basin



*Based on selected stations

April 1 reservoir storage for the Upper Yakima reservoirs was 521,500-acre feet, 94% of average. Forecasts for the Yakima River at Cle Elum are 78% of average and the Teanaway River near Cle Elum is at 66%. Lake inflows are all forecasted to fall into the same range this summer. March streamflows within the basin were Yakima near Cle Elum at 137% and Cle Elum River near Roslyn at 137%. April 1 snowpack was 73% based upon 12 snow courses and SNOTEL readings within the Upper Yakima Basin. Precipitation was 184% of average for March and 83% year-to-date for water. Volume forecasts for the Yakima Basin are for natural flow. As such, they April differ from the U.S. Bureau of Reclamation's forecast for the total water supply available, which includes irrigation return flow.

Upper Yakima River Basin

Streamflow Forecasts - April 1, 2003

		<===== Drier =====		Future Conditions		===== Wetter =====>>		
Forecast Point	Forecast Period	=====		Chance Of Exceeding *		=====		30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
=====								
KEECHELUS LAKE INFLOW	APR-JUL	78	88	95	79	102	112	121
	APR-SEP	84	96	104	78	112	124	133
KACHESS LAKE INFLOW	APR-JUL	75	83	88	79	93	101	111
	APR-SEP	80	89	95	79	101	110	120
CLE ELUM LAKE INFLOW	APR-JUL	295	315	330	81	345	365	408
	APR-SEP	320	345	360	80	375	400	448
YAKIMA at Cle Elum	APR-JUL	575	615	645	79	675	715	822
	APR-SEP	625	675	705	78	735	785	903
TEANAWAY near Cle Elum	APR-JUL	75	87	95	66	103	115	143
	APR-SEP	60	81	96	66	111	132	146

UPPER YAKIMA RIVER BASIN Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage ***		
		This Year	Last Year	Avg
KEECHELUS	157.8	76.7	97.4	114.1
KACHESS	239.0	177.8	113.8	169.4
CLE ELUM	436.9	267.0	198.2	270.1

UPPER YAKIMA RIVER BASIN Watershed Snowpack Analysis - April 1, 2003

Watershed	Number of Data Sites	This Year as % of	
		Last Yr	Average
UPPER YAKIMA RIVER	12	60	73

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

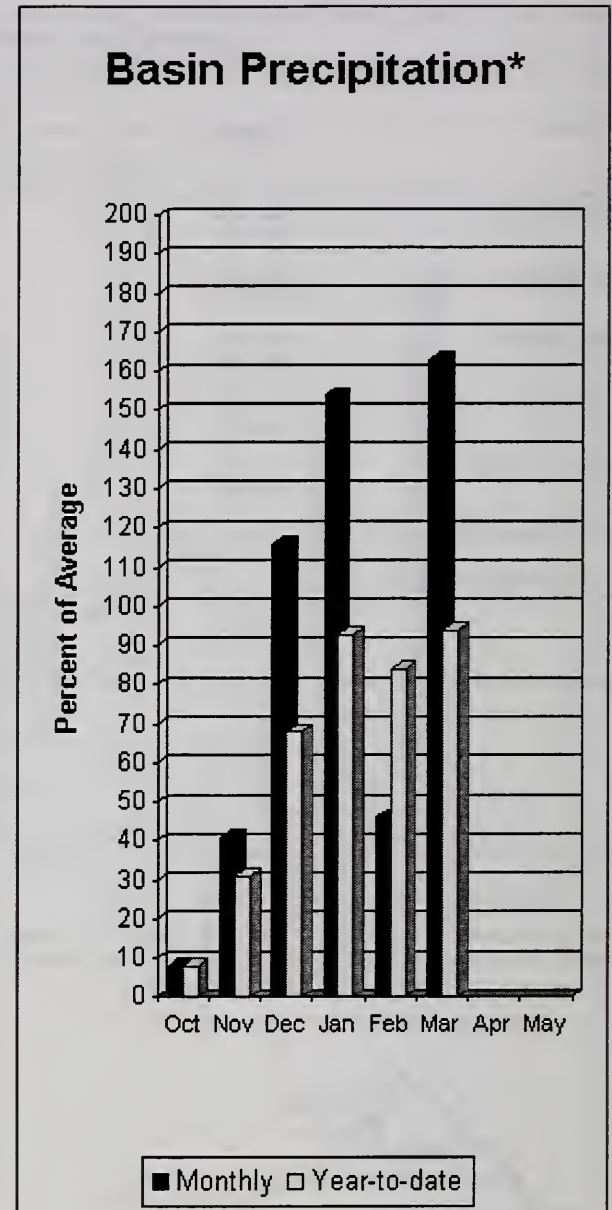
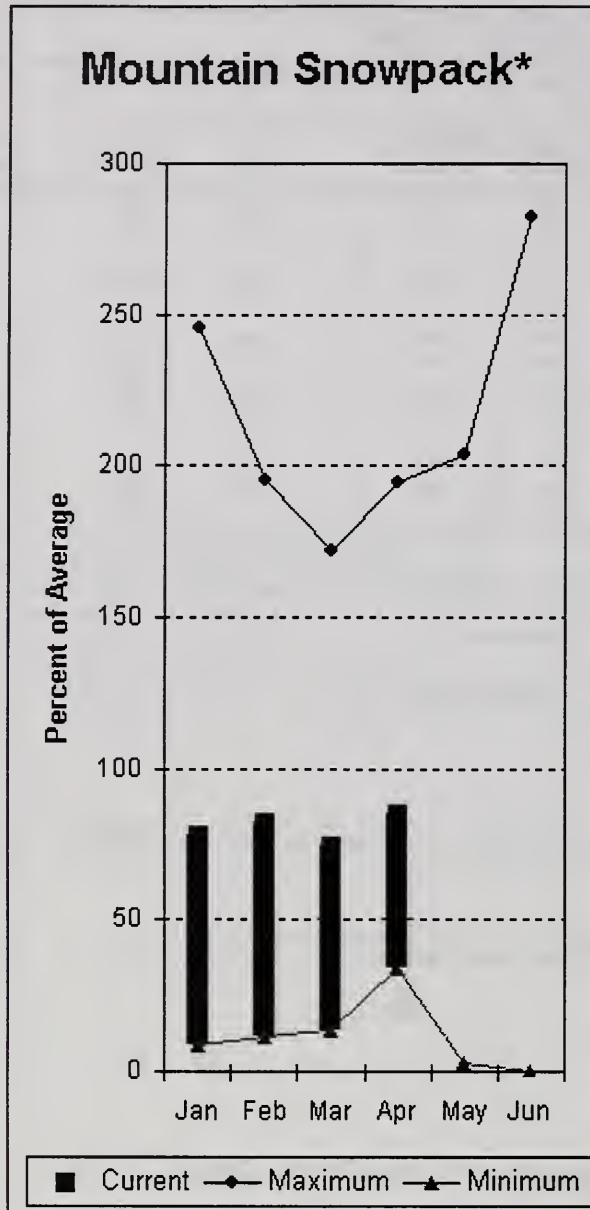
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Upper Yakima River Basin Percent of Average April 1, 2003

Snowpack - 73%
 Precipitation - 83%
 Reservoir Capacity - 94%

Lower Yakima River Basin



*Based on selected stations

March average streamflows within the basin were: Yakima River near Parker, 121%; Naches River near Naches, 113%; and Yakima River at Kiona, 92%. April 1 reservoir storage for Bumping and Rimrock reservoirs was 198,000-acre feet, 131% of average. Forecast averages for Yakima River near Parker are 81%; American River near Nile, 86%; Ahtanum Creek, 80%; and Klickitat River near Glenwood, 69%. April 1 snowpack was 85% based upon 8 snow courses and SNOTEL readings within the Lower Yakima Basin. Precipitation was 163% of average for March and 94% year-to-date for water. Temperatures were 3-4 degrees above normal for the month and 2 degrees above average for the water year. Volume forecasts for Yakima Basin are for natural flow. As such, they April differ from the U.S. Bureau of Reclamation's forecast for the total water supply available, which includes irrigation return flow.

For more information contact your local Natural Resources Conservation Service office.

Lower Yakima River Basin

Streamflow Forecasts - April 1, 2003

Forecast Point	Forecast Period	<<===== Drier =====>>		Future Conditions		===== Wetter =====>		30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	Chance Of Exceeding * (% AVG.)	30% (1000AF)	10% (1000AF)	
BUMPING LAKE INFLOW	APR-SEP	99	107	112	84	117	125	134
	APR-JUL	90	97	102	84	107	114	122
AMERICAN RIVER near Nile	APR-SEP	89	96	101	86	106	113	118
	APR-JUL	81	88	93	86	98	105	108
RIMROCK LAKE INFLOW	APR-SEP	175	190	200	83	210	225	242
	APR-JUL	150	161	169	83	177	188	204
NACHES near Naches	APR-SEP	605	650	680	81	710	755	837
	APR-JUL	550	590	620	82	650	690	758
AHTANUM CREEK nr Tampico (2)	APR-SEP	20	30	37	80	44	54	46
	APR-JUL	18.6	28	34	81	40	49	42
YAKIMA near Parker	APR-SEP	1390	1490	1560	81	1630	1730	1918
	APR-JUL	1260	1350	1410	82	1470	1560	1731
KLICKITAT near Glenwood	APR-JUN	75	84	90	70	96	105	129
	APR-SEP	91	104	113	69	122	135	163

LOWER YAKIMA RIVER BASIN Reservoir Storage (1000 AF) - End of March					LOWER YAKIMA RIVER BASIN Watershed Snowpack Analysis - April 1, 2003		
Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg	Watershed	Number of Data Sites	This Year as % of Last Yr Average
BUMPING LAKE	33.7	29.8	15.5	13.1			
RIMROCK	198.0	168.2	116.2	138.5			

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

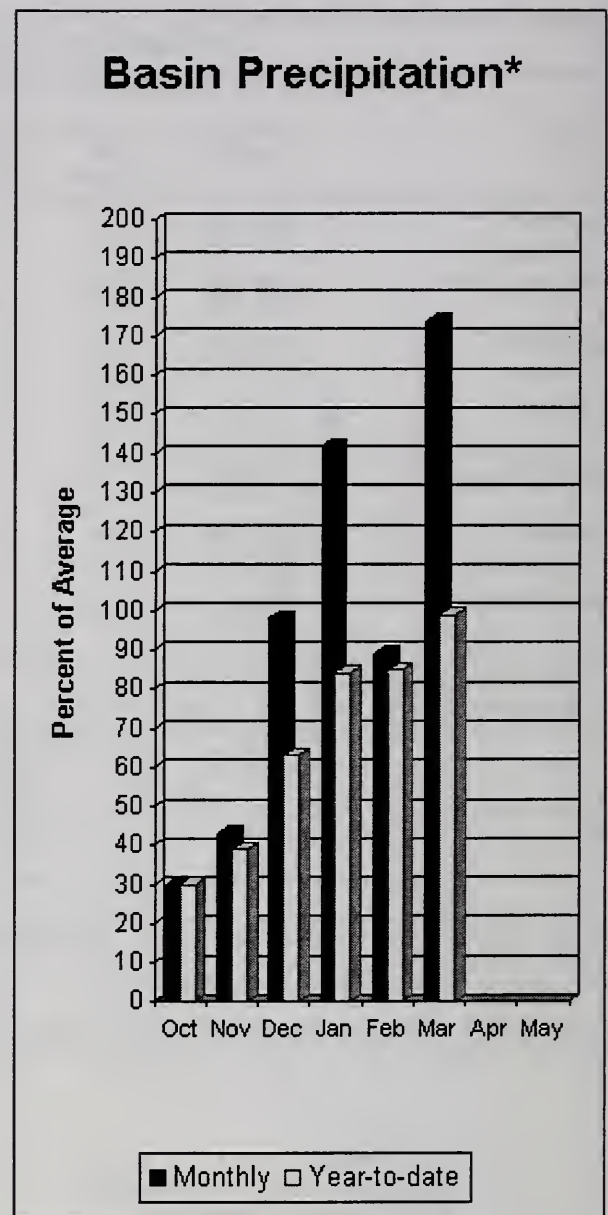
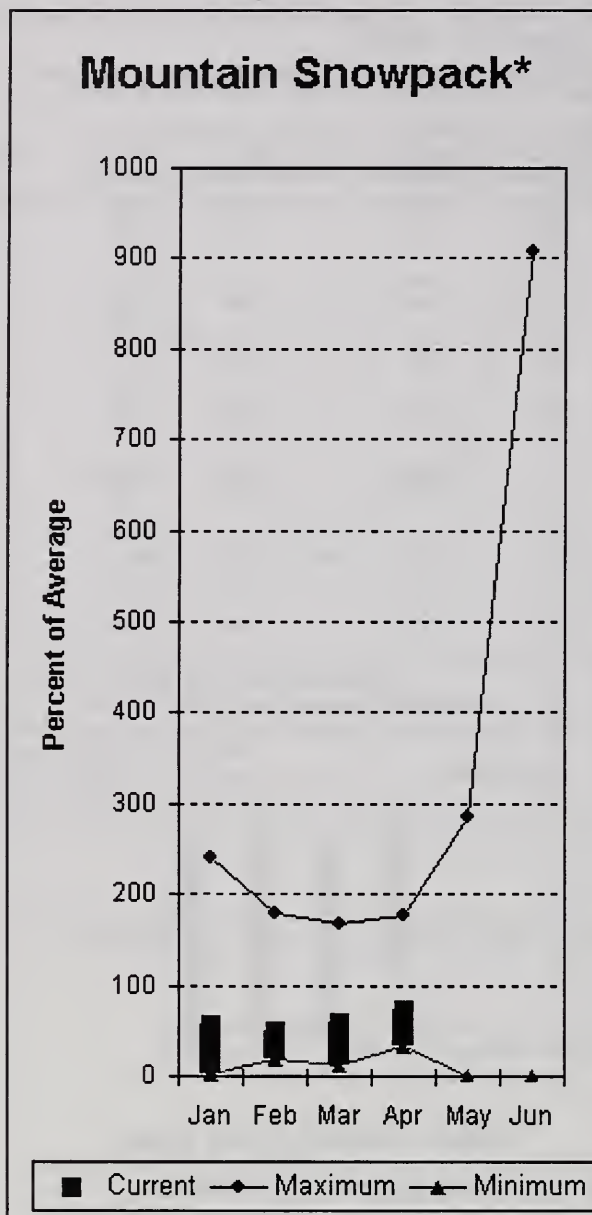
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Lower Yakima River Basin
Percent of Average
April 1, 2003

Snowpack - 85%
Precipitation - 94%
Reservoir Capacity - 131%

Walla Walla River Basin



*Based on selected stations

March precipitation was 174% of average, maintaining the year-to-date precipitation at 99% of average. Snowpack in the basin was 73% of average. Streamflow forecasts are 55% of average for Mill Creek and 74% for the SF Walla Walla near Milton-Freewater. March streamflow was 271% of average for the Walla Walla River. Average temperatures were 4 degrees above normal for March and 2 degrees above average for the water year.

For more information contact your local Natural Resources Conservation Service office.

Walla Walla River Basin

Streamflow Forecasts - April 1, 2003

Forecast Point	Forecast Period	<----- Drier ----->		Future Conditions		>----- Wetter ----->		30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	Chance Of Exceeding * (% AVG.)	30% (1000AF)	10% (1000AF)	
MILL CREEK at Walla Walla	APR-SEP	4.2	7.8	10.2	55	12.6	16.2	18.4
	APR-JUL	4.0	7.6	10.0	55	12.4	16.0	18.2
SF WALLA WALLA near Milton-Freewater	APR-JUL	31	36	39	74	42	47	53
	APR-SEP	40	45	49	74	53	58	66

WALLA WALLA RIVER BASIN Reservoir Storage (1000 AF) - End of March					WALLA WALLA RIVER BASIN Watershed Snowpack Analysis - April 1, 2003			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
					WALLA WALLA RIVER	2	58	73

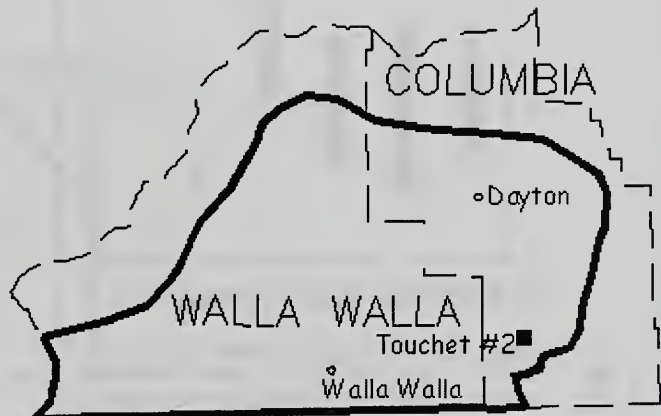
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

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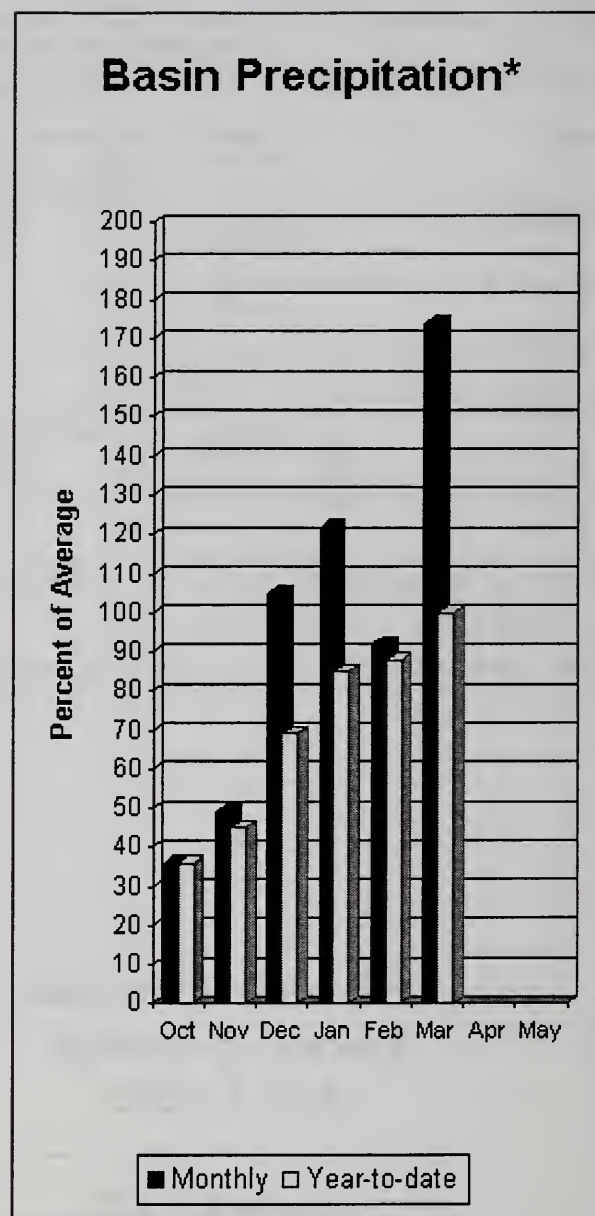
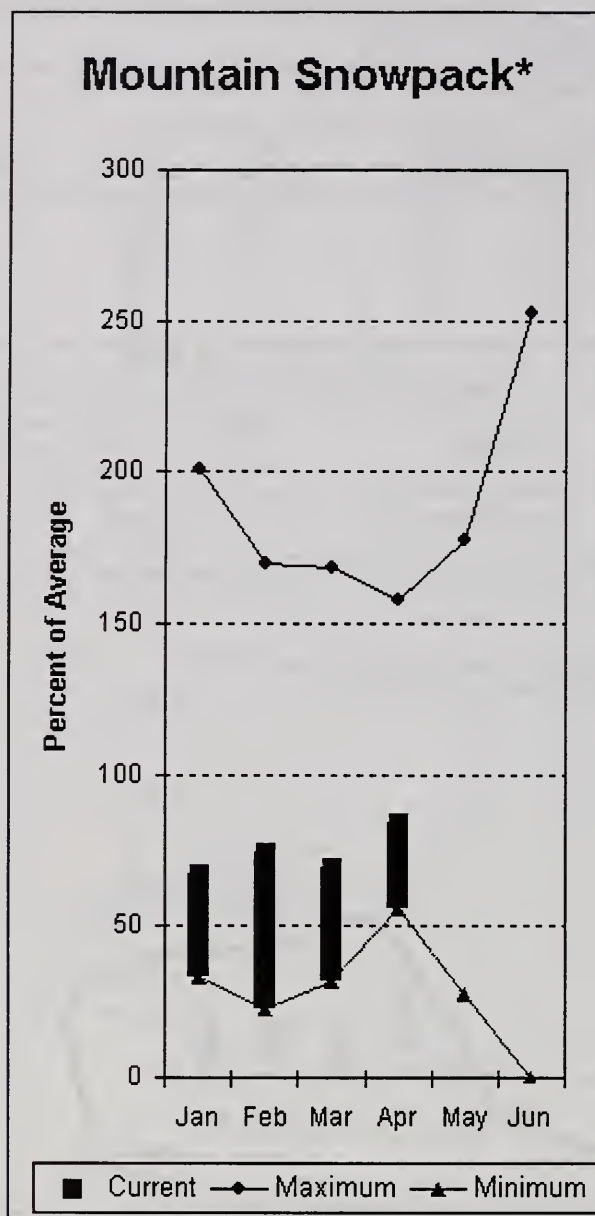
Walla Walla River Basin
Percent of Average
April 1, 2003

Snowpack - 73%
Precipitation - 99%



High Ridge ■

Lower Snake River Basin



*Based on selected stations

The April - September forecast is for 93% for Clearwater River at Spalding. The Snake and Grande Ronde rivers can expect summer flows to be about 80% and 67% of normal respectively. March precipitation was 174% of average, bringing the year-to-date precipitation to 100% of average. April 1 snowpack readings averaged 84% of normal. March streamflow was 88% of average for Snake River below Lower Granite Dam and 124% for Grande Ronde River near Troy. Average temperatures were 3 degrees above normal for March and 1 degree above normal for the water year.

Lower Snake River Basin

Streamflow Forecasts - April 1, 2003

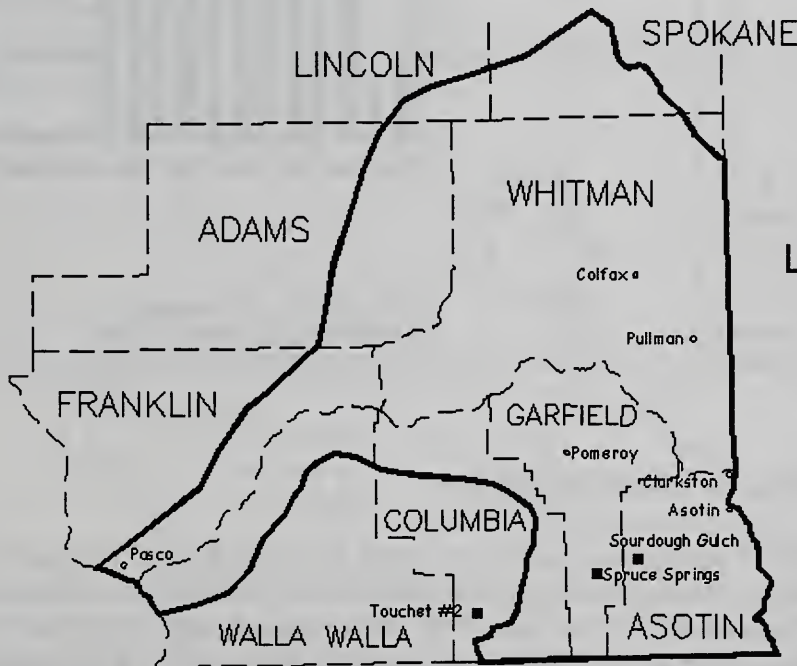
		<<===== Drier ===== Future Conditions ===== Wetter =====>>						
Forecast Point	Forecast Period	=====						
		90% (1000AF)	70% (1000AF)	Chance Of Exceeding * 50% (Most Probable) (1000AF) (% AVG.)		30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
GRANDE RONDE at Troy (1)	APR-JUL	504	738	845	66	952	1185	1274
	APR-SEP	552	805	920	67	1035	1290	1372
CLEARWATER at Spalding (1,2)	APR-JUL	5090	6310	6870	92	7430	8650	7435
	APR-SEP	5510	6730	7290	93	7850	9070	7850
SNAKE blw Lower Granite Dam (1,2)	APR-JUL	12184	15565	17100	79	18640	22020	21550
	APR-SEP	13675	17474	19200	80	20930	24730	24100

LOWER SNAKE RIVER BASIN Reservoir Storage (1000 AF) - End of March					LOWER SNAKE RIVER BASIN Watershed Snowpack Analysis - April 1, 2003			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
					LOWER SNAKE, GRANDE RONDE	17	75	84

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

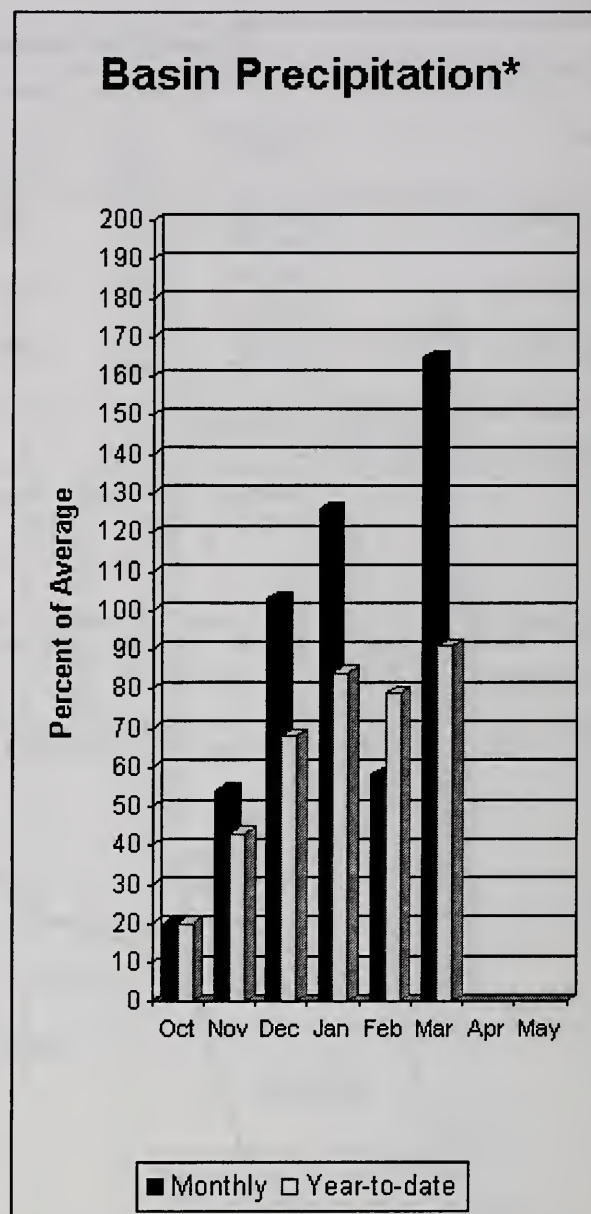
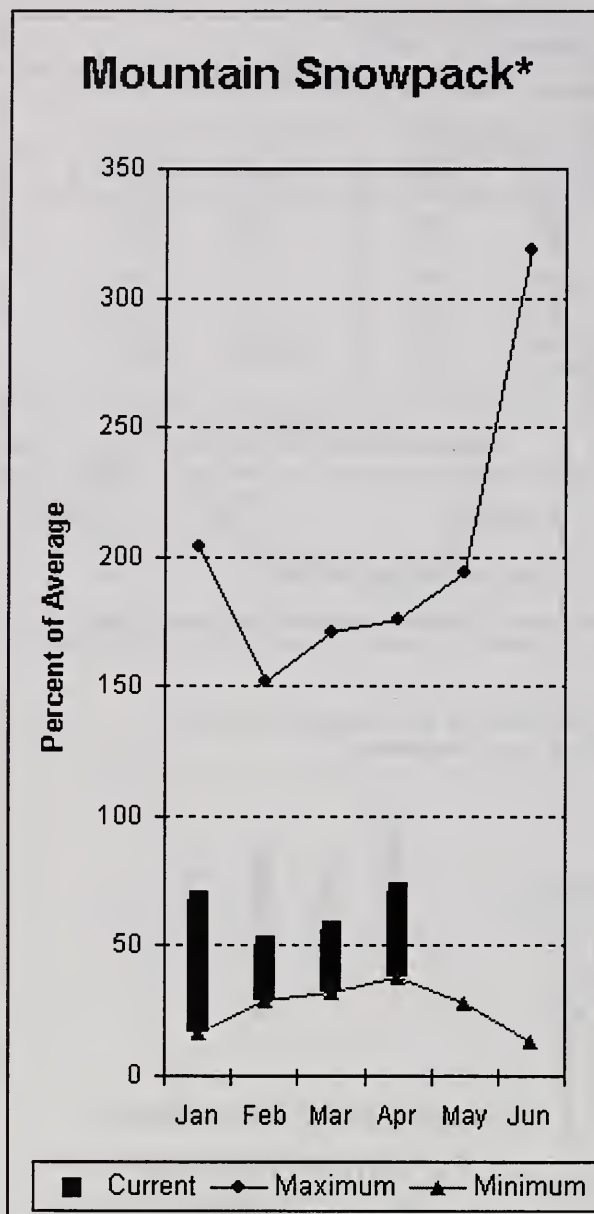
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Lower Snake River Basin
Percent of Average
April 1, 2003

Snowpack - 84%
Precipitation - 100%

Cowlitz - Lewis River Basins



*Based on selected stations

Forecasts for April – September streamflows within the basin are Lewis River at Ariel, 85% and Cowlitz River at Castle Rock, 81% of average. March average streamflow for Cowlitz River was 147% and 157% for Lewis River. The Columbia River at the Dalles was 95% of average. March precipitation was 165% of average and the water-year average was 91%. April 1 snow cover for Cowlitz River was 78%, and Lewis River was 64% of average. Average temperatures were 2 degrees above normal during March and have averaged 2 degrees above throughout the water year.

For more information contact your local Natural Resources Conservation Service office.

Cowlitz - Lewis River Basins

Streamflow Forecasts - April 1, 2003

Forecast Point	Forecast Period	<===== Drier ===== Future Conditions ===== Wetter =====>						30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	Chance Of Exceeding * 50% (Most Probable) (1000AF) (% AVG.)		30% (1000AF)	10% (1000AF)	
LEWIS at Ariel (2)	APR-JUL	613	778	890	86	1002	1167	1031
	APR-SEP	716	885	1000	85	1115	1284	1176
COWLITZ R. bl Mayfield Dam (2)	APR-SEP	678	1197	1550	81	1903	2422	1922
	APR-JUL	486	1006	1360	81	1714	2234	1689
COWLITZ R. at Castle Rock (2)	APR-SEP	932	1651	2140	81	2629	3348	2639
	APR-JUL	1023	1521	1860	81	2199	2697	2295
Klickitat near Glenwood	APR-JUN	75	84	90	70	96	105	129
	APR-SEP	91	104	113	69	122	135	163
COLUMBIA R. at The Dalles (2)	APR-SEP	66308	72555	76800	78	81040	87290	98650
	APR-JUL	54463	61154	65700	78	70250	76940	84650

COWLITZ - LEWIS RIVER BASINS Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage ***		
		This Year	Last Year	Avg

COWLITZ - LEWIS RIVER BASINS Watershed Snowpack Analysis - April 1, 2003

Watershed	Number of Data Sites	This Year as % of	
		Last Yr	Average
LEWIS RIVER	4	40	64
COWLITZ RIVER	6	71	78

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

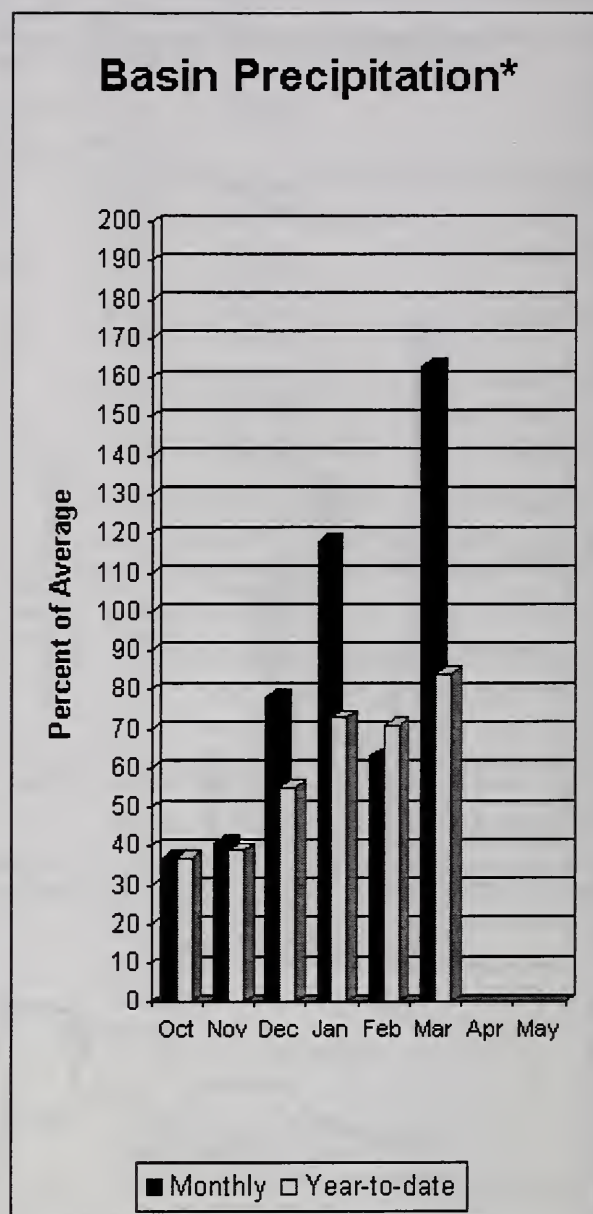
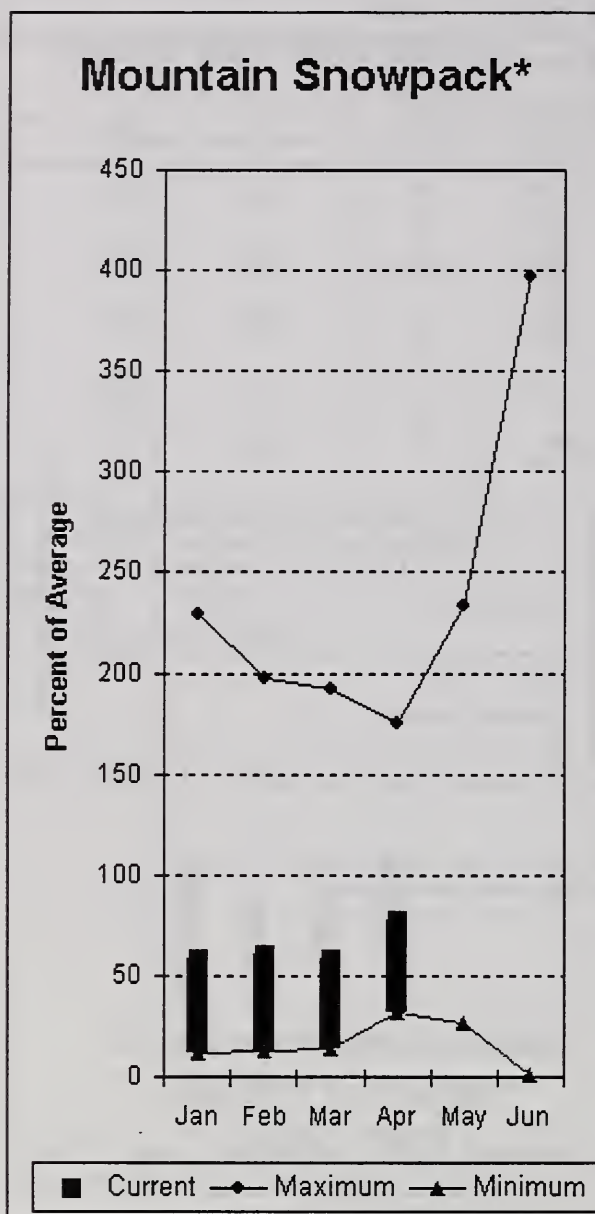
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Cowlitz-Lewis River Basins
Percent of Average
April 1, 2003

Snowpack - 71%
Precipitation - 91%

White - Green River Basins



*Based on selected stations

Summer runoff is forecast to be 86% of normal for the Green River below Howard Hanson Dam and 86% for the White River near Buckley. April 1 snowpack was 90% of average in both White River and Puyallup River basins and 64% in Green River Basin. Water content on April 1 at Corral Pass SNOTEL, at an elevation of 6,000 feet, was 31.3 inches. This site has an April 1 average of 34.9 inches. March precipitation was 163% of average, bringing the water year-to-date to 84% of average for the basins. Average temperatures in the area were 1 degree above normal last month and 1 degrees above for the water-year.

For more information contact your local Natural Resources Conservation Service office.

White - Green - Puyallup River Basins

Streamflow Forecasts - April 1, 2003

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	Chance Of Exceeding *		30% (1000AF)	10% (1000AF)	
WHITE near Buckley (1,2)	APR-JUL	309	361	385	88	409	461	440
	APR-SEP	387	448	475	89	502	563	534
GREEN below Howard Hanson (1,2)	APR-JUL	162	195	210	86	225	258	243
	APR-SEP	177	214	230	86	246	283	268

WHITE - GREEN - PUYALLUP RIVER BASINS Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage ***		
		This Year	Last Year	Avg

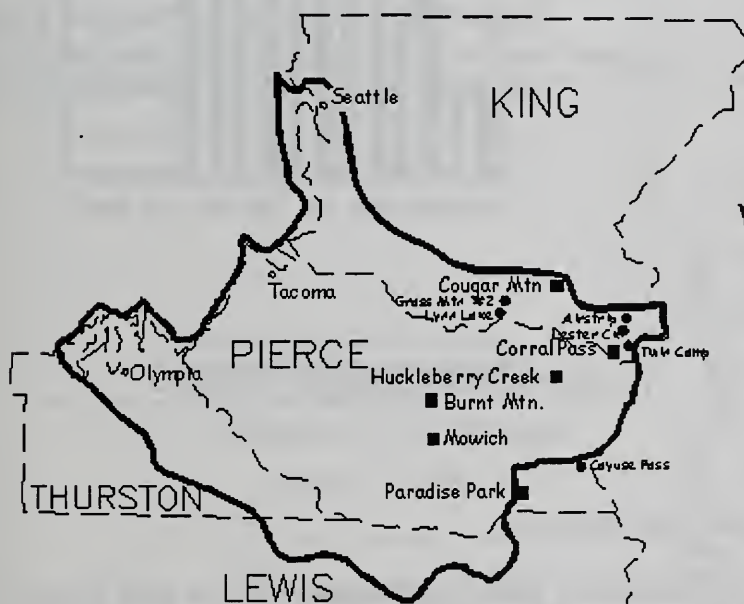
WHITE - GREEN - PUYALLUP RIVER BASINS Watershed Snowpack Analysis - April 1, 2003

Watershed	Number of Data Sites	This Year as % of	
		Last Yr	Average
WHITE RIVER	3	81	90
GREEN RIVER	7	41	64
PUYALLUP RIVER	3	79	90

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

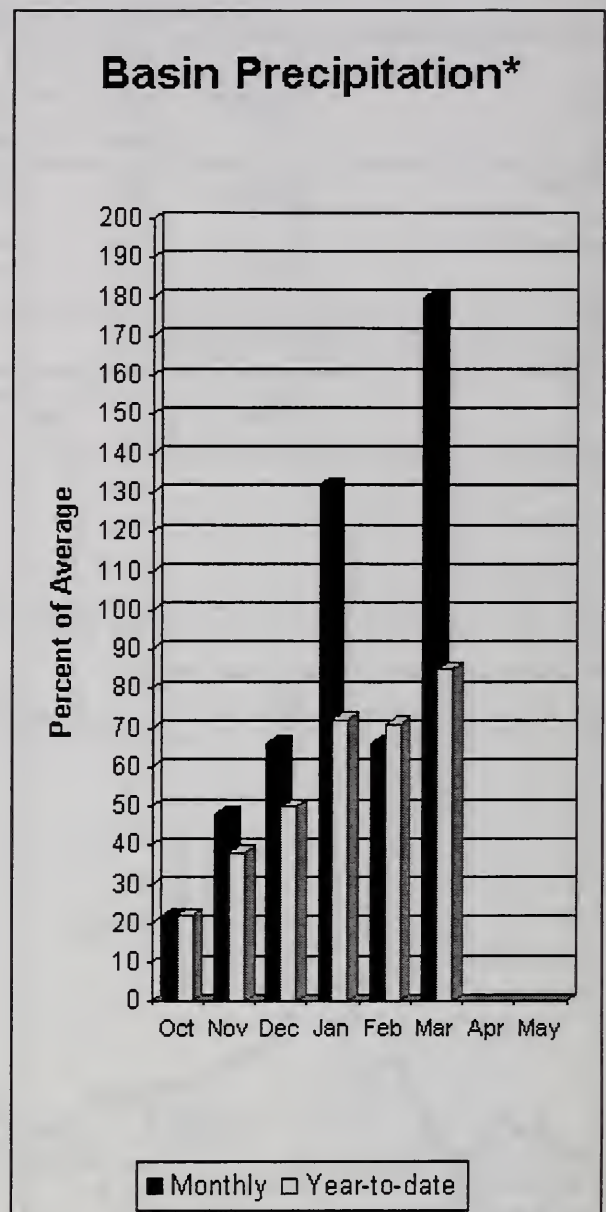
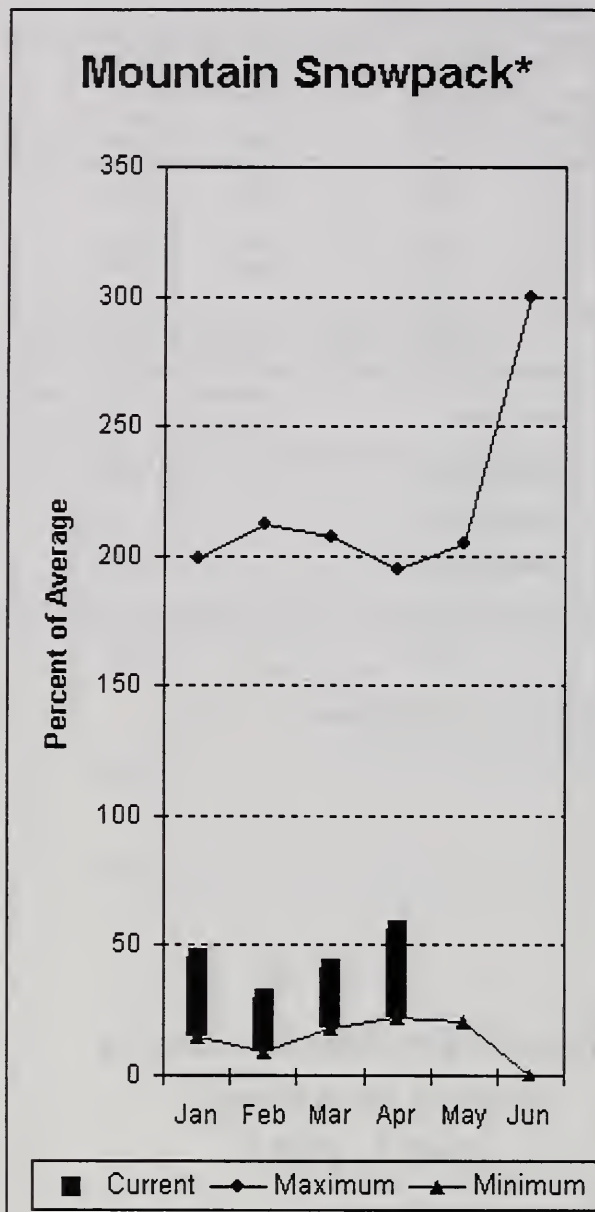
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White-Green-Puyallup Basins
Percent of Average
April 1, 2003

Snowpack - 77%
Precipitation - 84%

Central Puget Sound River Basins



*Based on selected stations

Forecast for spring and summer flows are: 89% for Cedar River near Cedar Falls; 89% for Rex River; 89% for South Fork of the Tolt River; and 86% for Cedar River at Cedar Falls. Basin-wide precipitation for March was 180% of average, bringing water-year-to-date to 85% of average. April 1 average snow cover in Cedar River Basin was 54%, Tolt River Basin was 48%, Snoqualmie River Basin was 61%, and Skykomish River Basin was 62%. Olallie Meadows SNOTEL site at 3960 feet, had 41.6 inches of water content. Average April 1 water content is 55.9 inches at Olallie Meadows. March temperatures were 1 degree above average for the past month and 1 degrees above normal for the water-year.

For more information contact your local Natural Resources Conservation Service office.

Central Puget Sound River Basins

Streamflow Forecasts - April 1, 2003

Forecast Point	Forecast Period	<----- Drier ----- Future Conditions ----- Wetter ----->						30-Yr Avg. (1000AF)
		=====		Chance Of Exceeding *		=====		
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
CEDAR near Cedar Falls	APR-JUL	50	58	64	88	70	78	73
	APR-SEP	56	65	71	89	77	87	80
REX near Cedar Falls	APR-JUL	15.3	19.3	22	88	25	29	25
	APR-SEP	17.7	22	25	89	28	32	28
CEDAR RIVER at Cedar Falls	APR-JUL	41	53	62	84	71	83	74
	APR-SEP	44	55	63	86	71	82	73
SOUTH FORK TOLT near Index	APR-JUL	10.6	12.0	13.0	88	14.0	15.4	14.7
	APR-SEP	11.9	13.8	15.0	89	16.2	18.1	16.9

CENTRAL PUGET SOUND RIVER BASINS Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage ***		
		This Year	Last Year	Avg

CENTRAL PUGET SOUND RIVER BASINS Watershed Snowpack Analysis - April 1, 2003

Watershed	Number of Data Sites	This Year as % of	
		Last Yr	Average
CEDAR RIVER	5	32	54
TOLT RIVER	3	23	43
SNOQUALMIE RIVER	6	38	59
SKYKOMISH RIVER	4	41	59

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

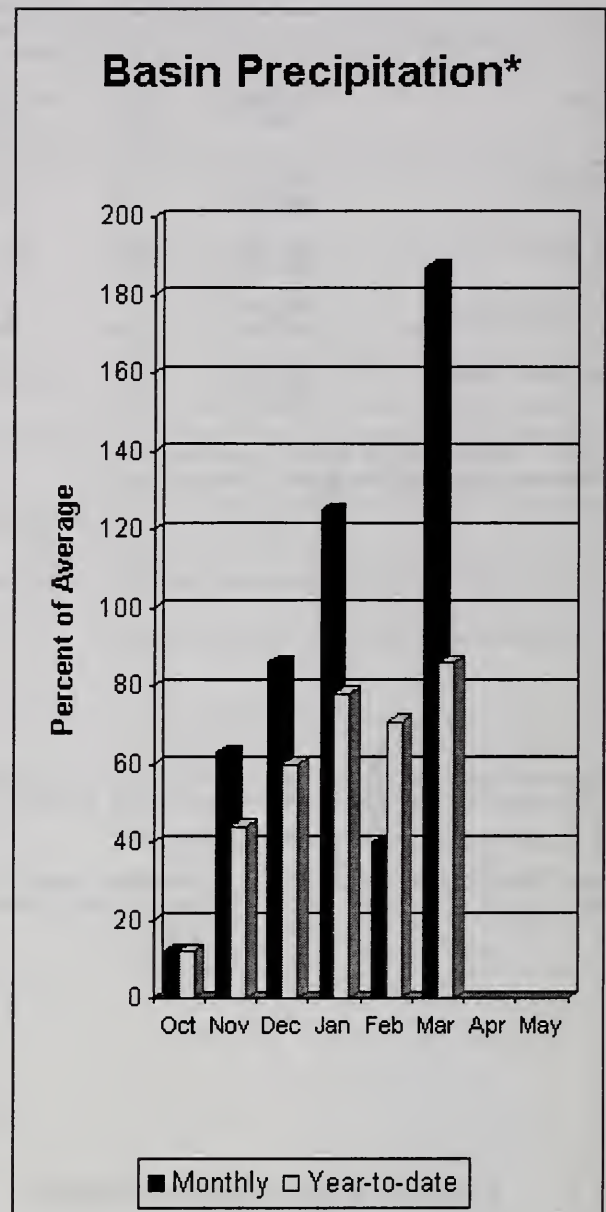
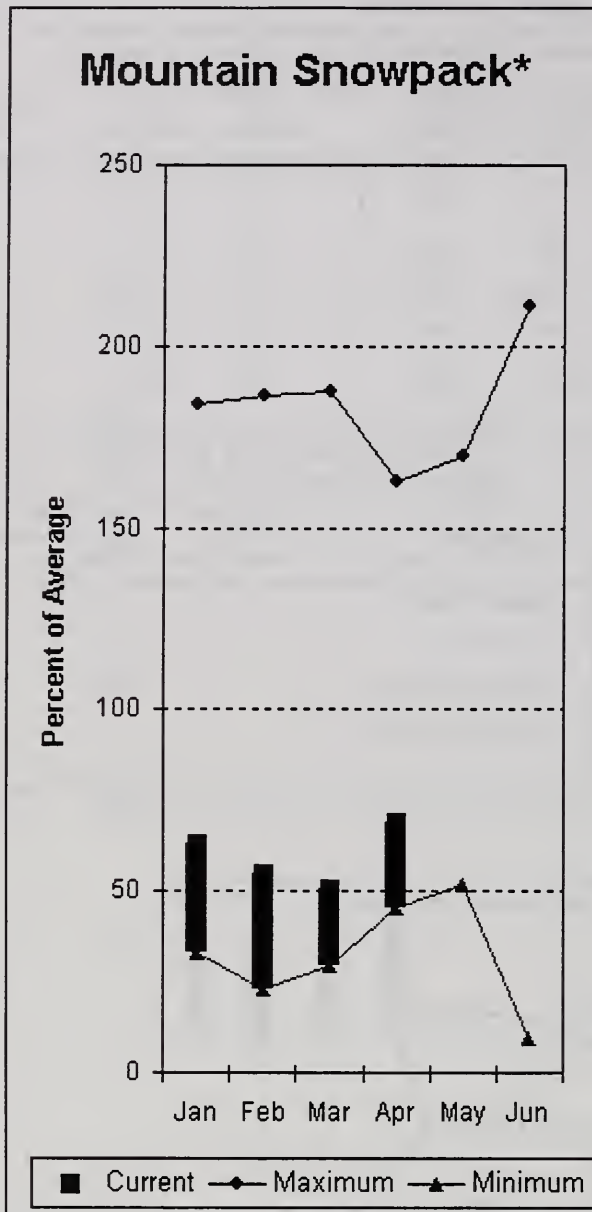
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- (2) - The value is natural volume - actual volume may be affected by upstream water management.

Central Puget Sound Basins Percent of Average April 1, 2003

Snowpack - 56%
Precipitation - 85%



North Puget Sound River Basins



*Based on selected stations

Forecast for Skagit River streamflow at Newhalem is 84% of average for the spring and summer period. March streamflow in Skagit River was 140% of average. Other forecast points included Baker River at 83% and Thunder Creek at 87% of average. Basin-wide precipitation for March was 187% of average, bringing water-year-to-date to 86% of average. April 1 average snow cover in Skagit River Basin was 73%, Baker River Basin was 69% and Nooksack River Basin was 64%. Rainy Pass SNOTEL, at 4,780 feet, had 28.4 inches of water content. Average April 1 water content is 44 inches at Rainy Pass. April 1 Skagit River reservoir storage was 135% of average and 71% of capacity. Average March temperatures were 2-3 degrees above normal for the basin and 2 degrees above average for the water year.

For more information contact your local Natural Resources Conservation Service office.

North Puget Sound River Basins

Streamflow Forecasts - April 1, 2003

Forecast Point	Forecast Period	<===== Drier =====		Future Conditions		===== Wetter =====>		30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	Chance Of Exceeding * (% AVG.)	30% (1000AF)	10% (1000AF)	
THUNDER CREEK near Newhalem	APR-JUL	173	189	200	86	211	227	234
	APR-SEP	261	278	290	87	302	319	333
SKAGIT at Newhalem (2)	APR-JUL	1404	1509	1580	85	1651	1756	1864
	APR-SEP	1660	1785	1870	84	1955	2080	2217
BAKER RIVER near Concrete	APR-JUL	585	644	685	83	726	785	828
	APR-SEP	747	820	870	83	920	993	1050

NORTH PUGET SOUND RIVER BASINS Reservoir Storage (1000 AF) - End of March					NORTH PUGET SOUND RIVER BASINS Watershed Snowpack Analysis - April 1, 2003			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of =====	
		This Year	Last Year	Avg			Last Yr	Average
ROSS	1404.1	970.9	584.5	693.0	SKAGIT RIVER	11	57	73
DIABLO RESERVOIR	90.6	85.8	86.0	86.2	BAKER RIVER	3	51	69
GORGE RESERVOIR	9.8	8.1	6.9	8.0	NOOKSACK RIVER	2	49	64

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

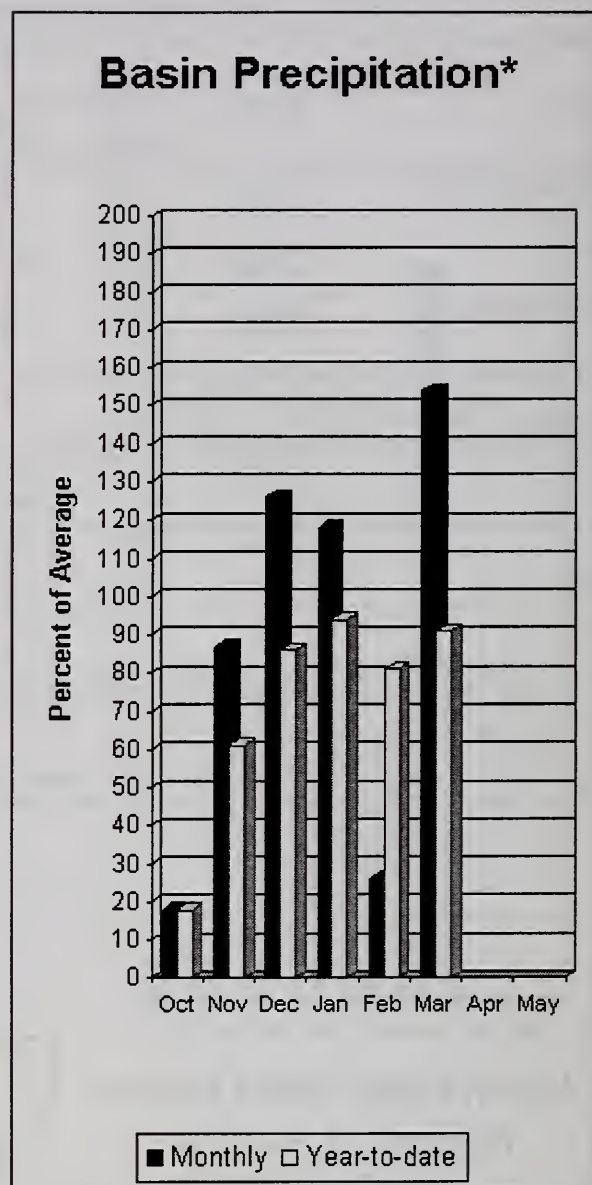
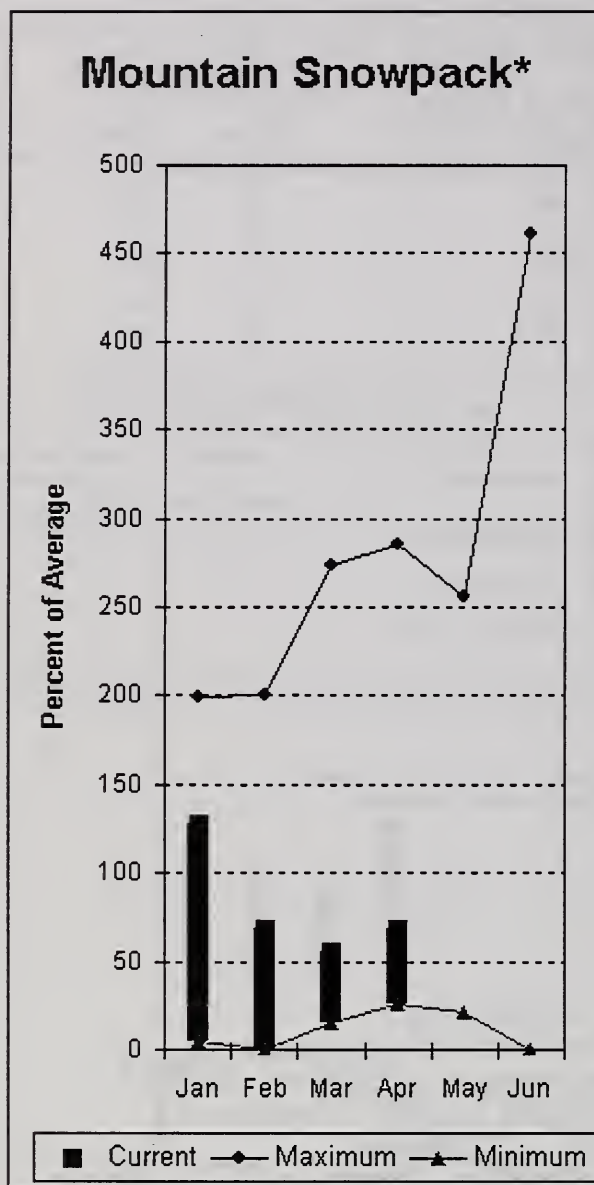
(2) - The value is natural volume - actual volume may be affected by upstream water management.

North Puget Sound Basins
Percent of Average
April 1, 2003

Snowpack - 69%
Precipitation - 86%
Reservoir Capacity - 135%



Olympic Peninsula River Basins



*Based on selected stations

Forecasted average runoff for streamflow in the Dungeness River and Elwha River basins is 85% and 84% respectively. Big Quilcene River should expect slightly below average runoff this summer. March precipitation was 154% of average. Precipitation has accumulated at 91% of average for the water year. March precipitation at Quillayute was 14.68 inches. The thirty-year average for March is 10.98 inches. Olympic Peninsula snowpack averaged 68% of normal on April 1. However Hurricane Ridge snow course reported only 45% average snow-water-content on March 23rd. Mt. Crag SNOTEL, on the East slope, reported 74%. Temperatures were 2 degrees above average for the month and 1-2 degrees above average for the water year.

For more information contact your local Natural Resources Conservation Service office.

Olympic Peninsula River Basins

Streamflow Forecasts - April 1, 2003

Forecast Point	Forecast Period	<<===== Drier =====		Future Conditions		===== Wetter =====>>		30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	Chance Of Exceeding * (% AVG.)	30% (1000AF)	10% (1000AF)	
DUNGENESS near Sequim	APR-SEP	111	122	129	85	136	147	152
	APR-JUL	92	101	107	86	113	122	124
ELWHA near Port Angeles	APR-SEP	359	395	420	84	445	481	503
	APR-JUL	297	329	350	84	371	403	419

OLYMPIC PENINSULA RIVER BASINS Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage ***		
		This Year	Last Year	Avg

OLYMPIC PENINSULA RIVER BASINS Watershed Snowpack Analysis - April 1, 2003

Watershed	Number of Data Sites	This Year as % of	
		Last Yr	Average
OLYMPIC PENINSULA	4	52	68
ELWHA RIVER	1	39	45
MORSE CREEK	1	61	76
DUNGENESS RIVER	1	37	62
QUILCENE RIVER	1	63	74
WYNOOCHEE RIVER	0	0	0

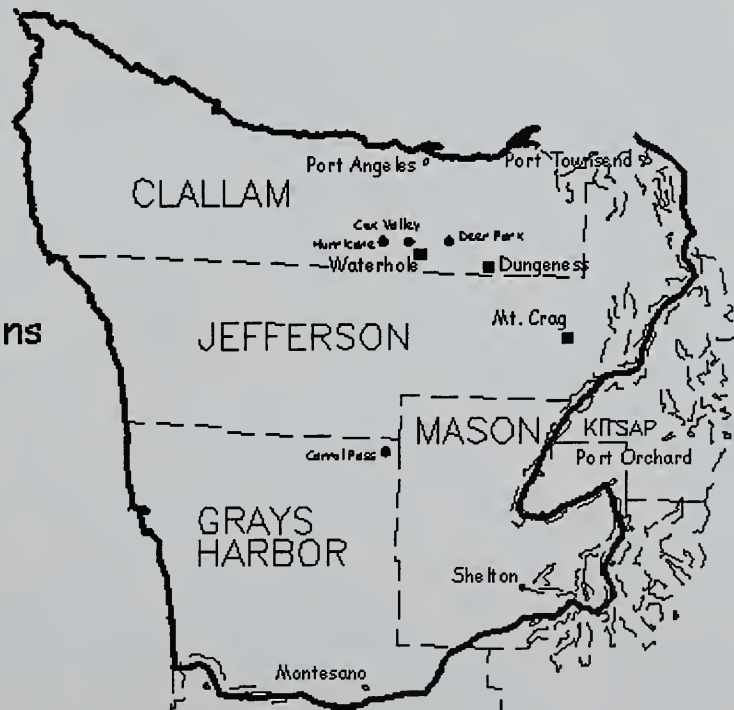
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural volume - actual volume may be affected by upstream water management.

Olympic Peninsula River Basins
Percent of Average
April 1, 2003

Snowpack - 68%
Precipitation - 91%





Issued by

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The Following Organizations Cooperate with the Natural Resources Conservation Service in Snow Survey Work*:

Canada	Ministry of Sustainable Resources Snow Survey, River Forecast Centre, Victoria, British Columbia
State	Washington State Department of Ecology Washington State Department of Natural Resources
Federal	Department of the Army Corps of Engineers U.S. Department of Agriculture Forest Service U.S. Department of Commerce NOAA, National Weather Service U.S. Department of Interior Bonneville Power Administration Bureau of Reclamation Geological Survey National Park Service Bureau of Indian Affairs
Local	City of Tacoma City of Seattle Chelan County P.U.D. Pacific Power and Light Company Puget Sound Power and Light Company Washington Water Power Company Snohomish County P.U.D. Colville Confederated Tribes Spokane County Yakama Indian Nation Whatcom County Pierce County
Private	Okanogan Irrigation District Wenatchee Heights Irrigation District Newman Lake Homeowners Association Whitestone Reclamation District

*Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.



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Washington Water Supply Outlook Report

Natural Resources Conservation Service
Spokane, WA

